UNIVERSITY OF ALBERTA

Adolescent Smoking Prevention:

An Evaluation of *Butt Ugly*, A Peer-Led Interactive Drama Intervention

by

Laurie Anne McCaffrey

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Master of Science

in

Medical Sciences - Public Health Sciences

Edmonton, Alberta

Spring 1999

National Library of Canada
Acquisitions and Bibliographic Services
395 Wellington Street
Ottawa ON K1A 0N4
Canada

Bibliothèque nationale du Canada
Acquisitions et services bibliographiques
395, rue Wellington
Ottawa ON K1A 0N4
Canada

Your file Votre référence

Our file Notre référence

The author has granted a non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of this thesis in microform, paper or electronic formats.

The author retains ownership of the copyright in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de cette thèse sous la forme de microfiche/film, de reproduction sur papier ou sur format électronique.

L'auteur conserve la propriété du droit d'auteur qui protège cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

0-612-40087-5

Canada

UNIVERSITY OF ALBERTA

LIBRARY RELEASE FORM

Name of Author: Laurie Anne McCaffrey

Title of Thesis: Adolescent Smoking Prevention:
An Evaluation of *Butt Ugly*, A Peer-Led Interactive Drama Intervention

Degree: Master of Science

Year this Degree Granted: 1999

Permission is hereby granted to the University of Alberta Library to reproduce single copies of this thesis and to lend or sell such copies for private, scholarly, or scientific research purposes only.

The author reserves all other publication and other rights in association with the copyright in the thesis, and except as hereinbefore provided, neither the thesis nor any substantial portion thereof may be printed or otherwise reproduced in any material form whatever without the author's prior written permission.

Laurie McCaffrey

7915-B 114 Street
Edmonton, Alberta
T6G 1M9

January 28th, 1999

UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled *Adolescent Smoking Prevention: An Evaluation of Butt Ugly, A Peer-Led Interactive Drama Intervention* submitted by Laurie McCaffrey in partial fulfillment of the requirements for the degree of Master of Science in Medical Sciences – Public Health Sciences.

Dr. Ollie Triska

Dr. Doug Wilson

Dr. Cameron Wild

Dr. Brenda Munro

Date January 26/99

DEDICATION

I would like to dedicate this work to

my mom

Dorothy McCaffrey

Thank you for always believing in me.

ABSTRACT

The main objectives of the present study were to determine if there is a relationship between smoking status and exposure to the anti-tobacco drama, *Butt Ugly*, and to obtain an indication of students' perceived influence of the drama.

Junior high students who saw the play were less likely to have tried smoking than those from a comparison region who did not see the play. There was no relationship for high school students.

Most junior high students believe the play influenced both their decisions and the decisions of other students. Most high school students believe that the play did not influence their decisions, although most believe that *Butt Ugly* was influential for other students.

The results suggest that the drama was effective in capturing students' attention, and communicating the prevention message, with behavioural differences at the junior high level.

Strengths and limitations of both the intervention and the study design are discussed, as well as future research directions and implications of the present findings.

ACKNOWLEDGEMENTS

I would like to sincerely thank my thesis advisors, Dr. Ollie Triska and Dr. Doug Wilson, for all of their guidance and support throughout the entire process of completing my thesis. I would also like to thank committee member, Dr. Cam Wild, who graciously offered his time and energy and provided thorough comments and suggestions across various drafts of the thesis. I'd like to thank Dr. Brenda Munro for her enthusiasm in agreeing to participate during my oral defense and for providing valuable feedback and many thoughtful comments about my study. I was truly blessed with a very professional, thorough, and caring team of committee members.

I'd also like to specifically thank Ollie for sharing the use of her office. I am truly grateful.

I'd like to thank Gail Foreman (public health nurse and producer of the drama) for her constant enthusiasm and dedication to the project. Gail was instrumental in gaining support from school boards and administrators, and provided valuable assistance arranging initial interviews and meetings necessary to conduct this study. Without these contacts, the present study would not have been possible.

I would particularly like to thank all of the school board administrators, school principals, and classroom teachers for graciously arranging their schedules such that I could conduct the survey with their students. I would like to recognize and thank all of the junior high and high school students who shared their time and provided

valuable comments and insight about adolescent tobacco use and prevention strategies.

I'd also like to thank the comparison region personnel for their generous sharing of data, and to acknowledge and thank those students who participated in the comparison surveys. I'd also like to thank all of the staff at Action for Smoking and Health for their assistance with various aspects of my thesis preparation.

This study would also not have been possible without the constant support and friendship received from fellow graduate students and friends. Specifically, I'd like to thank Hélène O'Connor, Tanis Hampe, Tania Stafinski, and Trevor Strome. Each of these individuals contributed to my thesis work directly, from assisting with data collection and response category validation, to reading, reviewing, and editing my thesis, and serving as committee members in my practice defense. I would also like to thank all of the Public Health Sciences Students who have provided encouragement both indirectly and directly around the Department.

I would like to thank the administrative staff of the Public Health Sciences Department, whose willingness to help and genuine concern for student well-being made my graduate school experience that much more enjoyable.

Finally, I'd like to thank Ron Smith – for always being willing to listen, for providing critical comments and feedback, and for helping me to keep everything in perspective.

I thank you all very sincerely.

TABLE OF CONTENTS

Chapter 1: Introduction and Background 1

Chapter 2: Literature Review 4

Introduction 4

Demographics/Characteristics of Smokers 4

Classification of Types of Adolescent Smokers 8

Defining adolescent smoking 8

Previous results with adolescents 12

Validity of self-reports 13

Prevention Literature 15

Characteristics of effective educational strategies 15

Application of social learning theory to tobacco use prevention 17

Peer leaders 19

Live theatre 21

Qualitative development of prevention programs 24

Follow-up studies 25

Chapter 3: Methods 27

Introduction 27

Intervention 27

Participant Selection 30

Long-term Follow-up Participant Selection 30

Short-term Follow-up Participant Selection 31
Sample Characteristics 32
Region A 32
Region B: Overall (Between Region Comparison Group) 34
Instruments 36
Region A: 36
Cigarette-related questions: 36
Questions related to the play: 37
Region B: 37
Procedure 37
Ethical Approval 37
Region A: 38
Region B: 39
Data Analysis 40
Chapter 4: Results Section Part 1: Smoking Rates 42
Introduction 42
Classification System 43
Classification of adolescent smoking status: Results 44
Within Region A Comparisons: 47
Between Region A1 and Region B Comparisons: 48
Logistic Regression Results: Junior High 50
Logistic Regression Results: Grade 7 52

Chapter 5: Results Section Part 2: Short Answer Responses **55**

Introduction 55

Research Questions 55

Short Answer Response Coding 56

Short Answer Results 57

Junior High 58

Junior High Response Frequencies: Did the Play Influence You? 59

High School 61

Chapter 6: Discussion **65**

Introduction 65

Research Questions 65

Smoking Rates 66

Within Region A 66

Between Regions 67

Junior High 67

Grade 7 69

High School 71

Short Answer Responses 71

Junior High 71

High School 73

Strengths 75

Sample size 75

Data collection procedures 75
Theoretical basis for program 76
Predictor variables 76
Blended approach 76
Limitations of Intervention 77
Limitations of the study design. 78
Within Region A comparisons 78
Peer smoking status 79
Teachers' resource manual 79
Post-test comparison group 80
Conclusions 82
Bibliography **85**
Appendix A: Tables **93**
Appendix B: Region A Smoking Survey **112**
Appendix C: Parental Information Letter **115**
Appendix D: Student Information Letter **116**

LIST OF TABLES

Table 1
Distribution of Region A Students
By Grade, School Level, and Exposure to the Play..... 33

Table 2
Mean Age and Standard Deviation of Region A Students
By School Level and Exposure to the Play..... 34

Table 3
Distribution of Region B Students by Grade and School Level..... 35

Table 4
Mean Age and Standard Deviation of Region B Students by School Level..... 35

Table 5
Percent of *Never-smokers*, *Triers*, and *Current Smokers* Overall for Each Region.... 45

Table 6
Percent of *Never-smokers*, *Triers*, and *Current Smokers*
By Grade and School Level for Each Region..... 46

Table 7
Junior High Response Frequencies: Did the Play Influence You?..... 59

Table 8
Junior High Response Frequencies: Did the Play Influence Others?..... 60

Table 9
High School Response Frequencies: Did the Play Influence You?..... 62

Table 10
High School Response Frequencies: Did the Play Influence Others?..... 63

Table A1.1
Proportion of Adolescents by Smoking Status (Gordon, 1986)..... 93

Table A1.2
Proportion of Adolescents by Smoking Status and Grade (Sussman, 1988)..... 93

Table A1.3
Proportion of Adolescents by Smoking Status, Grade, and Sex
(Abernathy & Bertrand, 1992)..... 94

Table A1.4
Proportion of Adolescents by Smoking Status (Wang et. al., 1996)..... 94

Table A2
Junior High Between Region A1 and B Results
Predicting *Never-smokers* versus *Triers* (Logistic Regression) 95

Table A3
Junior High Between Region A1 and B Results
Predicting *Triers* versus *Current Smokers* (Logistic Regression)..... 96

Table A4
Junior High Between Region A1 and B Results
Predicting *Never-smokers* versus *Current Smokers* (Logistic Regression) 97

Table A5
Grade Seven Between Region A1 and B Results
Predicting *Never-smokers* versus *Triers* (Logistic Regression) 98

Table A6
Grade Seven Between Region A1 and B Results
Predicting *Triers* versus *Current Smokers* (Logistic Regression) 99

Table A7
Grade Seven Between Region A1 and B Results
Predicting *Never-smokers* versus *Current Smokers* (Logistic Regression) 100

Table A8
Categories of Junior High Students' "YES" Responses to the question:
Do you think the play *Butt Ugly* has influenced **your** decision whether
or not to smoke cigarettes? 101

Table A9
Categories of Junior High Students' "NO" Responses to the question:
Do you think the play *Butt Ugly* has influenced **your** decision whether
or not to smoke cigarettes? 102

Table A10
Categories of Junior High Students' "BOTH" Responses to the question:
Do you think the play *Butt Ugly* has influenced **your** decision whether
or not to smoke cigarettes? 103

Table A11
Categories of Junior High Students' "YES" Responses to the question:
Do you think the play *Butt Ugly* has influenced **other students'** decisions whether
or not to smoke cigarettes?.....104

Table A12
Categories of Junior High Students' "NO" Responses to the question:
Do you think the play *Butt Ugly* has influenced **other students'** decisions whether
or not to smoke cigarettes? 105

Table A13
Categories of Junior High Students' "BOTH" Responses to the question:
Do you think the play *Butt Ugly* has influenced **other students'** decisions whether
or not to smoke cigarettes? 106

Table A14
Categories of High School Students' "YES" Responses to the question:
Do you think the play *Butt Ugly* has influenced **your** decision whether
or not to smoke cigarettes? 107

Table A15
Categories of High School Students' "NO" Responses to the question:
Do you think the play *Butt Ugly* has influenced **your** decision whether
or not to smoke cigarettes.....108

Table A16
Categories of High School Students' "YES" Responses to the question:
Do you think the play *Butt Ugly* has influenced **other students'** decisions whether
or not to smoke cigarettes?.....109

Table A17
Categories of High School Students' "NO" Responses to the question:
Do you think the play *Butt Ugly* has influenced **other students'** decisions whether
or not to smoke cigarettes?.....110

CHAPTER 1: INTRODUCTION AND BACKGROUND

Tobacco use is the leading cause of premature death in Alberta (Alberta Tobacco Reduction Plan Steering Committee: ATRPSC, 1997). Tobacco use is linked to over 40,000 Canadian deaths a year, accounting for more deaths than alcohol, traffic collisions, AIDS, illicit drugs, suicide, and murder combined (Cunningham, 1996; Tobacco Free Capital Region Network: TFCRN, 1997). Clearly, tobacco use prevention is an important public health goal.

Studies show that while there has been an overall trend toward lower rates of adult smokers since the mid-1950s, adolescents continue to take up the habit at an alarming rate (ATRPSC, 1997; Best, Thomson, Santi, Smith, & Brown, 1988; Cunningham, 1996.). The statistics are staggering. Every week, "the equivalent of a school bus full of minors begin using tobacco products" (TFCRN, 1997). Not surprisingly, efforts in tobacco reduction have shifted from cessation programs for adults to prevention programs for adolescents.

Since most smokers initiate their habit in adolescence (Breslau & Peterson, 1996; Escobedo, Marcus, Holtzman & Giovino, 1993; Pierce & Gilpin, 1996; Worden, Flynn, Solomon, Secker-Walker, Badger & Carpenter, 1996), tobacco prevention efforts have begun to focus on how to best encourage youth not to start smoking. There are many different approaches to prevent tobacco use among

adolescents. These range from legislation to education. The present study focuses on the educational approach to tobacco use prevention.

The purpose of the present study is to evaluate the effectiveness of a tobacco use prevention intervention aimed at junior high students that is currently being undertaken in a community in central Alberta. *Butt Ugly* is a tobacco-use prevention drama written and enacted by local high school students that has been performed for the surrounding junior high schools for the three years prior to this study; 1995, 1996, and 1997. This intervention is based on the premise that the high school students serve as role models for their younger peers. The drama includes facts and information about the dangers and consequences of tobacco use. Comedic and dramatic scenes are included, designed to evoke emotion and capture the students' attention. Small group discussions are held immediately following the presentation (each group is led by one of the high school actors). Students are encouraged to discuss their feelings and opinions about the play, tobacco use, etc. The intervention is described in more detail in the Methods section, Chapter 3.

There were two main objectives of the present study. First, the study sought to determine if there is a relationship between smoking status and exposure to the play – 6 months and two years later, and if so, the nature of that relationship. The second objective was to determine students' perceived effectiveness of the play. This was accomplished by asking students (a) "Do you think the play *Butt Ugly* has

influenced **your** decision whether or not to smoke cigarettes?" and (b) "Do you think the play *Butt Ugly* has influenced **other students'** decisions whether or not to smoke cigarettes? It is important to note that *Butt Ugly* targeted various forms of tobacco use prevention (including chewing tobacco). However, for the purposes of the present study, "smoking cigarettes" was specifically singled out versus all forms of tobacco use. This decision was based on the preference to maintain a specific focus for the thesis.

CHAPTER 2: LITERATURE REVIEW

Introduction

The literature review is organized according to three main sections. The first section will review demographics of youth smokers, including influencing factors for smoking initiation. The second section focuses on classification of adolescent smokers, including examples from published literature, and an indication regarding validity of self-reported smoking. The third section includes an overview of the prevention literature, including characteristics of effective smoking prevention interventions, the application of social learning theory to tobacco use prevention, peer leaders, the use of live theatre in substance use education, qualitative development of smoking prevention programs, and long-term follow-up of prevention programs. These components each relate to the purpose of the present study, an evaluation of a peer-led live theatre approach to adolescent smoking prevention.

Demographics/Characteristics of Smokers

According to the Tobacco Free Capital Region Network (1997), 35% of Alberta adults and 16% of youth age 11 to 17 were classified as smokers. These estimates were derived from self-report surveys conducted in 1994. Smokers were classified as those who report smoking cigarettes either "everyday" or "sometimes".

Despite longitudinal trends indicating overall lower rates of smoking (Cunningham, 1996), the "war on tobacco" is far from over. Indeed, Cunningham found that smoking rates have recently increased, especially among adolescents, after federal and some provincial tobacco tax rollbacks in 1994.

Tobacco use is adopted primarily in adolescence (Breslau & Peterson, 1996; Escobedo et al., 1993; Pierce & Gilpin, 1996; & Worden et al., 1996). Retrospective reports from adults indicate that most smokers initiated their habit before the age of 17 (Breslau & Peterson, 1996). Thus, if adolescents can be encouraged not to adopt the habit by the time they are 17, they are more likely to never start smoking.

Pierce and Gilpin (1996) estimate that "the adolescent who starts smoking now will smoke for at least 16 years if male and 20 years if female" (p. 255). Depending on the definition of "regular smoking", these estimates become closer to 20 years for males and 30 years for females. Moreover, other researchers have found that smokers who began smoking at age 12 or younger were more likely to be regular and heavy smokers than were those who began smoking at older ages (Escobedo et al., 1993). Smokers who begin smoking later in life are more likely to quit smoking than those who start before age 13 (Breslau & Peterson, 1996).

These results suggest that interventions which i) successfully prevent the uptake of tobacco use among adolescents (prevention), or ii) delay onset and/or decrease amount used (harm reduction) have lasting implications for health

promotion. Even if interventions do not prevent youth from ever experimenting with tobacco, those that encourage youth not to become regular smokers may be very important in reducing the population burden of tobacco.

To achieve either of these goals, one must develop an understanding of the factors associated with adolescents' decisions to smoke cigarettes. Indeed, there are countless influences on youth and tobacco use. Some of the most prominent influences include parental, sibling, and peer influence (Chassin et al., 1984). Adolescents whose parents, family members, and friends smoke are more likely to try smoking and to become regular smokers themselves. Another prominent influence includes tobacco advertising and promotion (Pierce & Gilpin, 1996). It has been shown that tobacco companies have targeted marketing strategies to attract new smokers, that is "the youth market" (Cunningham, 1996). Another factor associated with adolescent smoking is sports participation. Youth who participate in sports are less likely to smoke than youth who are not involved in sports (Escobedo et al., 1993).

Many studies have found that among adolescents, the proportion of *current smokers* is higher among girls than boys (Abernathy & Bertrand, 1992; Worden et al., 1996.) For example, the Tobacco Free Capital Region (1996) reports that of girls age 15 – 19, 31% are current smokers, whereas of boys in the same age category, 20% are current smokers. The trend for teenage girls to outnumber boys smoking has been

found to occur after about grade 6 or 7. While a greater proportion of males than females had tried smoking and were current smokers during grade 6, "by grade 7 the females had surpassed the males in the proportion of current smokers, and this gender difference continued across the subsequent two years" (Abernathy & Bertrand, 1992, p. 228).

Age, grade, and school level (junior high versus high school), and parental and sibling smoking status have also been identified as predictors of adolescent smoking behaviour. For example it has been shown that "adolescent smoking prevalence is positively correlated with grade level" (Bruvold, 1993, p. 876). Abernathy and Bertrand (1992) found that the year between grade 7 and 8 represented the most dramatic increase in the proportion of students who both tried smoking and currently smoke. It is also known that smoking rates escalate upon entry to high school (Manske et al., 1997), and that adolescents whose parents and siblings smoke are at greater risk for trying smoking and for becoming regular smokers (Chassen et al., 1984).

Based on these known factors associated with tobacco use, measures of age, sex, grade, school level, and parental and sibling smoking status were collected for the present study.

Classification of Types of Adolescent Smokers

Defining adolescent smoking

Adolescent smokers differ from adult smokers with respect to classification of their smoking status. Most adults can easily be classified as either smokers or non-smokers. Adolescent smoking, however, is more appropriately described as a series of transitions in a stage model of smoking acquisition (Chassin, Presson, Sherman, Corty, & Olshavsky, 1984; Gordon, 1986; Sussman, Dent, Mestel-Rauch, Johnson, Hansen , & Flay, 1988; Wang, Fitzhugh, Eddy, & Westerfield, 1996). The most widely accepted conclusion is that there are at least three stages in the adolescent smoking initiation process: *Never-smoker*, *Trier/Experimenter* and *Current smoker*. How these are defined have varied across studies.

Never-smokers have been fairly consistently defined as those who have never tried smoking, not even a puff (Abernathy & Bertrand, 1992; Sussman et al., 1988; Wang et al., 1996). *Triers* (sometimes referred to as *experimenters*) have been classified according to differing criteria. Examples of classification systems for *triers/experimenters* include youth that have tried smoking in the past, but:

(a) have not smoked in the past 30 days (Abernathy & Bertrand, 1992),

(b) have only smoked a few cigarettes in the past 12 months (Sussman et al., 1988),

or

(c) have smoked less than 100 cigarettes in their lifetime (Wang et al., 1996).

Current smokers have been defined as those who:

(a) have smoked at least one or more cigarettes in the past 30 days (Abernathy & Bertrand, 1992),

(b) have smoked at least one or more cigarettes in the past seven days (Sussman et al., 1988), or

(c) have smoked at least ten cigarettes out of the past 30 days and greater than 100 cigarettes in their lifetime (Wang et al., 1996).

Current smokers have been further sub-classified into "occasional", "light", and "heavy" smokers depending on the number of reported cigarettes smoked per day (Escobedo et al., 1993).

The three groups of smokers differ on a number of belief, attitude, and behavior variables. For example, Gordon (1986) found that *current smokers* were significantly less likely than *triers* and *never-smokers* to believe that any smoking is harmful. *Triers* were more likely than *never-smokers* to believe that smoking would make them more relaxed, although less likely to believe so than smokers. The results of this study show that "adolescents who have tried smoking in the past are significantly different from adolescents who say that they have never smoked on a number of factors theoretically important for smoking onset" (p. 174). Wang et al. (1996) found that "*experimental smokers* perceived smoking behavior more

positively in their attitudes and beliefs than nonsmokers…(and) less positive than the *regular smokers*" (p. 9).

Sussman et al. (1988) found that *triers* gave more inflated estimates than *never-smokers* of the proportion of adults and adolescents who smoke. Perceiving that smoking behaviour is more prevalent than is actually the case suggests that these youth are more likely to become smokers in the future.

The important distinction drawn from these studies is that the three groups of "smoker-types" respond quite differently to the same questions regarding tobacco use beliefs and behaviours. In particular, there is a difference between *never-smokers* and *triers*, such that *triers*' attitudes and beliefs toward smoking place them more at risk of becoming a smoker in the future than *never-smokers*. As Wang et al. (1996) note: "*experimental smokers* are characterized, though to a lesser degree than *regular smokers*, as possessing positive health beliefs and attitudes concerning smoking and smokers" (p. 9). That is, regular smokers and experimental smokers are more likely to think that smoking is not harmful than *never-smokers*.

Moreover, there are considerable differences in the reasons for smoking among *experimenters* and *current smokers*. The presence of smoking peers may strongly influence an adolescent's decisions to *experiment* with tobacco. As Best et al. (1988) note: "The final transition to a regular smoking stage can become more pharmacologically based, as nicotine dependence develops." (p. 163). Thus,

programs can have differential effects for different types of smokers. A peer led program may be more effective for those who have not yet progressed to a regular smoking status.

Indeed, programs may work differently as a function of the student's prior experience with tobacco. There is also the consideration that many students may never have smoked, even without the intervention. For example, in a pre-test post-test treatment design, researchers found no evidence of impact on pre-test *never-smokers* (Biglan, Severson, Ary, Faller,Gallison, Thompson, Glasgow, and Lichtenstein, 1987.) However, the authors reported that *triers* were more likely than *regular smokers* to have quit smoking at post-test. Best et al. (1988) describe the results from a social influences based smoking prevention program, which suggest that the " program works for boys by preventing *experimentation* and for girls by preventing transition to *regular smoking*" (p. 182).

Distinguishing between types of adolescent smoking is an important consideration when stating program objectives and in planning evaluations. For example, the Peer Assisted Learning (PAL) program's stated objective was to prevent youth from ever experimenting with tobacco (Abernathy & Bertrand, 1992). The authors report that "even though a substantial proportion of students in grade 9 have tried smoking, it may be that a portion of PAL's effectiveness will lie in inducing these *experimenters* not to go on to become *regular smokers*" (p. 229). That is, while

the program did not meet its stated objective to prevent all forms of experimentation, perhaps this was too stringent a goal. These authors note that "...if smoking interventions can reach those experimental smokers, there is an enhanced likelihood that such interventions will influence experimental smokers to adopt a behavior change towards returning to nonsmoking status" (p. 1). There is inherent acknowledgement that it is more difficult to change the behavior of established adolescent smokers versus experimental smokers.

Wang et al. (1996) argue that "since the majority of adolescents will experiment with smoking and since the modification of their smoking behavior may be easier to accomplish than reducing the incidence of an established behavior, experimental smoking should be the object of secondary prevention efforts" (p. 9).

What these classification systems illustrate is the importance of considering different types of adolescent smoking. Previous results with adolescents will be outlined next, although remember that different researchers have used different classification systems to label *triers/experimenters* and *current smokers*.

Previous results with adolescents

These results are included in Appendix A (Table A1.1 to Table A1.4) to provide an example of trends and findings of other researchers. The results are presented chronologically according to date of publication. Note that the proportion of each type of smoker varies across studies and across grade and age levels. The

lowest proportion of *current smokers* is reported by Abernathy and Bertrand (1992) who found that 4% of grade 6 females were *current smokers*. The highest proportion of *current smokers* is also reported by Abernathy and Bertrand who found that 27% of grade 9 females were *current smokers*. The proportion of *triers* ranges from 8% among both males and females in grade 7 and 8 (Gordon, 1986) to 59% among both males and females in grade 9 (Sussman, 1988). These are included to illustrate common findings in the literature.

Validity of self-reports

Unquestionably, the classification of adolescent smokers relies heavily upon the methods chosen to obtain reports of smoking. All self-report data are potentially subject to social desirability (Britt & Jachym, 1996). This represents a particular challenge when conducting self-report surveys with adolescents regarding the use of restricted substances, (i.e., tobacco products are illegal for those under 18 in Alberta). Thus, students may be likely to underreport their use of this substance, particularly when an authority figure conducts the survey, or when they perceive that parents or teachers may have access to their responses. Researchers have found that the accuracy of self-reports is increased when confidentiality is assured, specifically, when adolescents trust guarantees of confidentiality (Bell, Ellickson, & Harrison, 1993).

One often used measure to increase validity is the "bogus pipeline method" whereby students are told that their saliva samples will be taken and analyzed after their participation in the survey, and that these will be used to verify the accuracy of their self-reports. In fact, in the "bogus pipeline" technique, saliva samples are never analyzed. Some authors have found this condition to be unnecessary, as self-reports have not changed dramatically as a function of whether or not the bogus pipeline method was employed. Chassin et al. (1984) found that "a comparison of samples with and without bogus pipeline procedures...revealed no significant differences in reported smoking rates" (p. 229). Moreover, Hansen, Malotte, and Fielding (1985) found that between 11 and 14 percent of respondents refused to participate when asked to provide biological samples, and that predicted differences in self-reports between groups were not observed. For example, "for the first cohort [grade 9 students] there were no significant differences on measures of smoking behaviour between those receiving the threat of detection and those not receiving it. For the second cohort [grade 8 students] more subjects reported having ever used tobacco who were not under the bogus pipeline condition than those who were asked to give saliva specimens" (p. 790).

Of course, actual biochemical validation of saliva samples has been conducted in many studies. Many researchers consider biochemical validation procedures to be the "gold standard" for smoking studies; however, many others argue that there are

problems inherent in the biochemical validation procedures themselves (Kozlowski & Heatherton, 1990; Patrick, Cheadle, Thompson, Diehr, Koepsell, & Kinne, 1994). These findings show that biochemical validations procedures often do not detect very low levels of smoking, which is often the case for young smokers (e.g., *triers*, experimenters). Some studies which compare self-reports alone versus self-reports with biochemical validation (whether real or "bogus") have found that there are no significant differences in rate of reporting. Two authors suggest that all such "validation" is, in fact, "bogus" (Kozlowski & Heatherton, 1990). Thus, there is an interesting debate regarding what represents valid scientific data.

For the purposes of the present study, it was decided to administer the self-report surveys alone. Both written and verbal guarantees of confidentiality were extended to increase the likelihood of accurate response rates. Students were assured that their parents and teachers would not see their answers. The researcher collected the data, rather than an authority figure such as the students' teacher.

Prevention Literature

Characteristics of effective educational strategies

Since the focus of the present study is an evaluation of an educational prevention strategy, the literature review is limited to an overview of educational prevention methods. Other approaches, such as advertising restrictions, enforcement of legislation prohibiting tobacco sales to minors, and increased tobacco taxation

represent effective strategies that must also be considered in a comprehensive approach to tobacco control. However, they are not within the scope of the present study. What follows is an overview of school-based adolescent smoking prevention interventions.

Adolescent smoking prevention programs are often implemented within school settings because of the school's relatively easy access to the target population. Tobacco use prevention can be viewed as an extension of the traditional health education curriculum. In fact, many early programs tended to emphasize the "rational-informational" approach to smoking prevention. The strategy was to provide the individual with the facts (e.g., "smoking causes lung cancer"). The anticipated outcome was that the individual would make the rational decision not to smoke based on those facts. However, there is growing consensus that this approach is the least effective method for preventing adolescent smoking (Best et. al., 1988; Bruvold, 1993; Flay, Hansen, Johson, Collins, Dent, Dwyer, Grossman, Hockstein, Rauch, Sobel, Sussman, & Ulene, 1987; Glynn, 1989; Klepp, Halper, & Perry, 1986; Manske, Brown, and Cameron, 1997; Murray et.al., 1984; Perry & Kelder, 1992; Rundall & Bruvold, 1988; Telch, Miller, Killen, Cooke, & Maccoby, 1990). That is, simply providing the facts and teaching adolescents that smoking is bad for their health is not enough to prevent them from smoking.

Innovative approaches to adolescent smoking prevention, ones that incorporate social learning, social reinforcement, and insights from developmental theories are most likely to be successful in preventing the onset of adolescent smoking (Bruvold, 1993; Rundall & Bruvold, 1988). Such theories take into account the many mediating variables between knowledge and behavior, for example the effect of peer influences on smoking decisions. Many successful programs have borrowed concepts from Bandura's Social Learning theory (1977), to which I turn next.

Application of social learning theory to tobacco use prevention

Social Learning Theory is based on the premise that individuals learn new behaviours vicariously from watching others (Bandura, 1977). In general terms, behaviours for which others are rewarded are more likely to be modeled; behaviours resulting in punishment are less likely to be modeled. In the case of tobacco use, students must learn from direct experience or observation that anti-smoking behavior is followed by positive contingencies and pro-smoking behavior is followed by negative contingencies. Students may learn that smoking causes shortness of breath by observing the performance of models with high social status.

According to social learning theory, behaviour is learned symbolically through central processing of response information before it is performed. For modeling to be effective, four processes must occur:

1. Attentional processes: The individual must pay attention to the behaviour being modeled.

2. Retentional processes: The individual must retain (remember) the behaviour that was modeled.

3. Motor reproduction processes: The individual must be able to perform the behaviour.

4. Motivational processes: The individual must be sufficiently motivated to perform the given behaviour. Those behaviours that seem to be effective for others are favoured.

Thus, not all behaviour that is modeled is imitated. To increase the likelihood that behaviour will be learned, many factors must be considered (e.g., models with high status, competence, and power are more effective). It is essential that all four of these processes are met. For instance, if the individual does not pay attention to the behaviour, no social learning will occur.

Given that peers exert strong influence on adolescents, and that older peers are often looked up to by their younger counterparts (i.e., possess high status), older peers have been used successfully in tobacco use prevention interventions. An overview of the use of peers in prevention programs follows.

Peer leaders

Developmental psychological theory suggests that "during adolescence, the smoking behavior and perceived attitudes of their peer group carry greater influence over adolescent behavior than the behavior and attitudes of parents and other adults." (Gordon, 1986, p. 164). There is considerable theoretical support for the employment of peer-leaders in tobacco use prevention programs (Glynn, 1989). Peer leaders can be very effective, by helping to promote social acceptance of non-smoking.

Murray, Richards, Luepker, and Johnson (1987) found that peer-led programs are more successful in deterring smoking than are teacher-led programs. Cohen, Felix, and Brownell (1988) conducted studies with peer-leaders versus regular classroom teachers to teach various health education material (e.g., smoking prevention; blood pressure monitoring). The researchers used *experimental smoking* as the outcome variable to test between group differences for the smoking prevention intervention. They found no differences between the peer-led and teacher led groups for experimental smoking; however, they note that "one year may not be a sufficient amount of time to detect change in smoking *experimentation*" (p. 252). Moreover, results may have been positive had they used a different outcome variable (e.g., it is difficult to prevent all types of experimentation). An alternative strategy is to encourage these experimental smokers not to progress to the next stage of established smoking.

Cohen et al. (1988) did find, however, that when older peers were used to teach children about blood pressure monitoring, students in the older peer-led group demonstrated greater behavioural capabilities than students in the teacher-led group. These results suggest that "peers can teach interventions that foster improved behavioral capabilities, and that they can provide an entire program without assistance from teachers" (p. 252). Further, they contend that "the utilization of older peers is encouraging and warrants further study with health-enhancing behaviors in adolescence" (p. 252).

Rooney and Murray (1996) report that:

> the impact of peer or social programs may be improved if they are delivered early during the transition from elementary to middle school (e.g., 6th grade), if same-age peers play a substantial role in delivering the intervention program, if they are part of a multicomponent health program, if booster sessions are included in subsequent years, and if peers are not over-trained (p. 61).

Taken together, these factors were associated with a 19% to 29% reduction in smoking. Clearly, there is support for the use of peer-leaders in health education, and specifically tobacco-use prevention interventions. It is important to note that the intervention, *Butt Ugly*, utilizes both older peers and live theatre as a means to

encourage youth not to smoke. An overview of the use of live theatre (one example from television) in education follows.

Live theatre

Live theatre has been used to successfully communicate drug prevention messages to adolescents, and to facilitate open discussion about drug use and related issues. The Under Pressure Program – an original, professionally scripted 30-minute live musical play, *Captain Clean*, featured singing, dancing, and contemporary music, followed by 90 minutes of role playing and interaction, providing the students with an opportunity to discuss their feelings and concerns (Safer & Harding, 1993).

The authors report that the Under Pressure Program is effective in producing immediate positive attitudinal growth toward issues related to alcohol abuse (Safer and Harding, 1993). The play was outlined according to major alcohol and drug abuse issues (e.g., general health concerns, relationships, counseling) and a survey tool was designed to measure student's attitudes toward these issues. The experimental group, after viewing the play and participating in the discussion session, demonstrated a significantly more positive attitude toward the areas of concern (general health, relationships, willingness to seek counseling, etc) at the posttest than at the pretest. Additionally, "summaries of the field notes indicate that the live theatre presentation, with subsequent discussion and role play, does solicit feedback in regard to the adolescents' feelings about substance abuse and using school counselors and

other resources available to them" (p. 147). The authors contend that "theatre provides an exciting form of teaching…*Captain Clean* invariably serves as a springboard for meaningful dialogue in post-performance group discussion" (p. 147).

According to Safer and Harding (1993): "One reason for the potency of the theatre in conveying a message on...drug abuse is that students are not just passive recipients of information. Their active participation can vary from becoming involved in a drama session to taking part in a discussion" (p. 139). This is relevant to the present study, because the students are afforded an opportunity to discuss the play *Butt Ugly* in small groups led by the student actors.

Further analysis of the Captain Clean study in 1996 indicates that one criterion for success appears to be "the combination of discussion and active participation with the media event" (Harding, Safer, Kavanagh, Bania, Carty, Lisnov, & Wysockey, 1996, p. 785). Since the actors led the adolescents in discussion and role-playing exercises there was an opportunity for the audience to actively participate in the event, rather than simply walking away at the end of the drama. Students indicated their appreciation of this opportunity. Moreover, students "expressed a strong desire for other students to see Captain Clean because they thought viewing the play would be of help to them" (p. 795). This indicates high perceived effectiveness of the intervention.

Johnston and Ettema (1982) studied the effects of the televised production *Freestyle* designed to break sex-role stereotypes of children. They found that children who discussed a television program in class evidenced more positive changes than children who did not discuss it. Also Flay (1986) notes that "mass media would never be truly effective unless supplemented with complementary school-based programs which afford children the opportunity to thoughtfully discuss a prevention message" (p. 404).

Gliksman, Douglas, and Smythe (1983) report positive effects of a live theatrical performance targeting alcohol use prevention. Grade 9 and 10 students were administered a pretest-posttest questionnaire assessing knowledge, attitudes, and behaviour related to alcohol use. The intervention, *BOOZE*, was a series of five alcohol-related skits designed to illustrate problems associated with alcohol use. The one hour live theatrical performance was as effective in influencing attitudes, motives, and behaviors as was a four-hour formal presentation of alcohol use lesson plans. The authors report that interventions were effective in curtailing the consumption levels of those students who were initially moderate or heavy consumers.

Thus, the use of live theatre has met with success as an educational and social tool. An additional way to discover likely effective interventions is to ask adolescents directly: What types of interventions would successfully prevent youth from using

tobacco? An example of the use of qualitative development of smoking prevention programs follows.

Qualitative development of prevention programs

In determining components of effective programs, one can borrow from the wisdom of qualitative researchers. One positive aspect of qualitative studies is the tendency to include the target population in the design and delivery of programs in order to understand the phenomenon from their point of view. Parker, Sussman, Crippens, School, and Elder (1996) asked youth to hierarchically list the 5 methods they thought could help prevent teenagers from using tobacco. They were asked to indicate: (a) if each method would work for them (yes/no), (b) how likely it would succeed, and (c) its relevance to others their age in their community. According to the written feedback, the two most popular responses included methods that involved: 1) sports participation; and 2) countering social influences. Ninety-five percent of the respondents indicated that each method would work for them. The strategy with the highest likelihood of success was: "anti-drug education". The strategy with the highest mean relevance to others was: "sports participation".

The same youth also participated in small group discussions. They were asked (a) Why do you think youth smoke, and (b) If you were in charge of making a video to prevent smoking what would you include? Regarding the first question, most respondents indicated that youth smoke because of social influences (e.g.,

smoking by a caretaker). Regarding the second question, 6 groups indicated that showing long term physical consequences would be effective. Three groups indicated that showing short term consequences would be effective. Notably, the youth recommended strategies central to social learning theory interventions: showing positive social consequences of not smoking (e.g., having more friends) and negative social consequences of smoking (e.g., can't get a date).

This approach is relevant to the present study because it includes short answer questions assessing the students' perceived influence of the play. Moreover, given that students recommend the use of social learning components for prevention programs, the continued use of such programs is further justified.

Follow-up studies

Do prevention effects from elementary and junior high persist into high school? Unfortunately, many researchers report "no" (Ellickson, Bell, & McGuigan, 1993; Flay, Koepke, Thomson, Santi, Best, & Brown, 1989). For example, where students taught by peers had lower smoking rates than students taught by regular classroom teachers in junior high, program effects often disappear by grade 9, regardless of who taught the lesson (Bell et al., 1993). The authors lament that "the resistance skills learned during junior high are likely to decay without continued reinforcement" (p. 479). Moreover, "the many changes that adolescents experience

as they make the transition to high school may simply overwhelm earlier resistance training – both cognitive and behavioral..." (p. 480). The authors further contend that:

> any or all of these changes may be accompanied by new temptations to use drugs, and the strategies that worked during grade 7 or 8 may no longer be adequate in this altered environment. In addition, arguments that motivate seventh graders against using may be less relevant for ninth graders, who have a more sophisticated and cynical view of authority (p. 480).

Thus, it continues to be important to develop programs which are age appropriate and to work toward ensuring that program effects are long-lasting. Programming should continue into the high school years, to reinforce what was learned in junior high. Content should be relevant to the new pressures faced by high school students.

The findings from the literature review form the basis for the present study. The components of the study will be described in greater detail in the Methods section, chapter 3, which follows.

CHAPTER 3: METHODS

Introduction

The methods section includes an overview of the intervention, describing how it was designed and the participation of the high school student actors. Next follows a description of the participant selection procedures, both long term (high school students) and short term (junior high students). Data were collected in two regions of Alberta. The region within which the play was performed is referred to as Region A (these data were collected by the present researcher). The second region consists of pre-collected data used for comparative purposes (not collected by the present researcher). The comparison region is referred to as Region B. Sample characteristics of both the intervention and comparison groups are described. The instruments used are discussed, and specific questions used in analyses are presented. The procedure for data collection in both groups is outlined. Data analysis and the classification system utilized to define smoking status are described.

Intervention

The anti-tobacco drama, *Butt Ugly*, was written and performed by high school students from all three of Region A's high schools. The idea for the drama originated from an enthusiastic public health nurse who believed that the traditional lecture approach to smoking prevention was ineffective and did not hold the students'

attention. She collaborated with a theatre studies teacher/director and then partnered with a local community youth theatre group to devise a new approach to tobacco use prevention. The blessing of high school administrators was obtained to recruit high school students to participate in the new prevention project. Funding was initially obtained through the Alberta Lung Association but has more currently come from local service groups and businesses in the community.

High school students from the school drama departments and the youth community theatre group were recruited to participate in a live theatre production and were told they would be responsible for writing their own play. Student actors received course credit in their dramatic education course for participating in the drama. The public health nurse and a theatre director assisted the students by providing information, direction, and support, although the students were responsible for the play writing production. Students audition for the drama in the spring of the school year and prepare throughout the summer getting ready for production and touring in the fall. There are two separate casts of high school actors that travel around to the junior high schools in the Region.

The content of the drama is determined by the high school students, under the direction and assistance of the theatre director and the public health nurse. There are new actors every year and a new script every other year, although the theme of the play ("don't use tobacco") and the title *Butt Ugly* remain the same. During the year

in which the script remains the same, student actors are encouraged to make subtle changes, to ensure a sense of ownership over the production. The drama includes both comedic and dramatic scenes. For instance, in the first year, the drama included a Star Trek theme (e.g., the characters were dressed in Star Trek costumes). There were comedic scenes which highlight the problems with smoking as well as dramatic scenes (e.g., male character whose dad died from lung cancer performs an emotional soliloquy regarding his loss.) There are also scenes which depict smokers as being "uncool", (e.g., whose friends don't want to hang out with them if they smoke). Since the exact content of the play changes every second year, the messages portrayed represent the up to date experience of the high school students. Since it is their own material, they take pride in their work and are enthusiastic about sharing their experiences with junior high school students.

After the play, the students participate in small group discussions led by the high school actors. Students are then able to meaningfully discuss the issues presented in the drama and to ask questions of the high school students. After its second year of production, the *Butt Ugly* facilitators included a teachers' resource manual (also referred to as a teachers' pack) so that the teachers could continue to enforce the message presented by the drama. The facilitators acknowledged that the drama needed a more comprehensive lead in for optimal effectiveness. Unfortunately, it is unknown to what extent the teachers' packs were utilized.

Students from the surrounding junior high schools saw the play within the fall months of 1995, 1996, and 1997.

Participant Selection

Long-term Follow-up Participant Selection

This refers to students currently in high school who saw the play in the fall of 1995. It is important to note that there were no exact measures taken at baseline to determine which students had or had not seen the play. The play was presented to the surrounding junior high schools and presumably junior high students present on that day watched the drama. Large groups of students (approximately 60 to 90 students per production) attended the presentation in the facilities available at their respective schools (e.g., libraries, classrooms, and drama rooms). Instead of attempting to identify/ recruit only those who had seen the play, it was decided (for both research and practical purposes) to survey intact classroom units (grade 9 and grade 10 classrooms). Thus, students who were believed to have seen the production in 1995 while they were in junior high (current grade 9 and 10 students) were surveyed. The researcher set up appointments with all of the grade 9 classrooms in two of the three high schools (where grade 9 is the first year of high school) and all of the grade 10 classrooms in the third high school (where grade 10 is the first year of high school). All students present the day of the classroom survey were asked to fill out the

questionnaire. Students who had not seen the drama were asked to participate and to omit the questions regarding the drama.

To assess whether or not respondents had seen the play, one of the survey questions included: "Did you see the play *Butt Ugly*?" There were both practical and research reasons for including all students present in the survey. A practical reason included ease of administration. Teachers did not have to devise alternate activities for those not participating (e.g., those not participating would not distract the other students). For research purposes, encouraging students who did not see the play to answer the same smoking behavior questions creates a within-region comparison group for analyses purposes.

Short-term Follow-up Participant Selection

This refers to students currently in junior high who saw the play the same school year, in the fall of 1997. Again, there were no exact measures taken to identify which students saw the play in the fall of 1997, other than grade 6 and grade 7 classrooms were invited to attend the presentations. Grade 6 and 7 classrooms were selected, and students within these classrooms were asked to fill out the survey. All of the grade 6 classrooms from four schools (where grade 6 is the first year of junior high) and grade 7 classrooms from three schools (where grade 7 is the first year of junior high) were surveyed.

Sample Characteristics

Region A

There were 1417 students surveyed in Region A. Of these, 16 were excluded from the analysis due to either incomplete data (n=2) or restriction of range for age and grade (n=14; sometimes grade 11 and 12 students were in attendance of grade 9 and 10 classes, and some students were older than 17). The total sample size for Region A is 1401 (Table 1). Students ranged in age from 11 to 17. The distribution of Region A students by grade, school level, and exposure to the play is presented in Table 1. Those who saw the play are labelled Region A1 and those who did not see the play are labelled Region A2. Mean age and standard deviations are reported in Table 2.

Table 1

Distribution of Region A Students by Grade, School Level, and Exposure to the Play

Grade/School Level	A1:Saw Play	A2:Did not see play	Total
Grade 6	446	60	506
Grade 7	229	25	254
Junior High Total	675	85	760
Grade 9	88	373	461
Grade 10	59	121	180
High School Total	147	494	641
Total	822[a]	579[b]	1401[c]

[a] 49.5% males, 50.5% females. [b] 54.6% m, 45.4% females. [c] The total sample consisted of 51.6% males and 48.4% females.

Table 2

Mean Age and Standard Deviation of Region A Students by School Level and Exposure to the Play

School Level	A1:Saw Play	A2: Did not see play	Total
Junior High X age	11.86	12.00	11.87
Junior High S.D.	(.73)	(.80)	(.74)
High School X	14.99	14.83	14.87
High School S.D.	(.73)	(.72)	(.72)
Total X age	12.42	14.42	13.24
Total S.D.	(1.41)	(1.24)	(1.66)

Region B: Overall (Between Region Comparison Group)

There were 3161 students surveyed in Region B. Of these, 11 respondents were over the age of 17 and thus were excluded from the analysis. The remaining 3150 students ranged in age from 11 to 17 years, the same range as that of the Region A respondents. The sample size for junior and high school students from Region B is presented in Table 3. The mean age and standard deviations are presented in Table 4.

Table 3

Distribution of Region B Students by Grade and School Level

Level	**Grade**	**Total**
Junior High	Grade 7	1669
High School	Grade 10	1481
Total N		3150[a]

[a]The total sample consisted of 51.3% males and 48.1% females.

Table 4

Mean Age and Standard Deviation of Region B Students by School Level.

Level	**Mean Age**	**Standard Deviation**
Junior High	12.44	.59
High School	15.44	.58
Total	13.85	1.61

Instruments

To measure smoking status in each Region, students were asked to complete a self-report questionnaire regarding cigarette use. The complete survey for Region A is reproduced in Appendix B.

Region A:

The data were obtained through a 22-item survey consisting of nine multiple choice cigarette related questions; four demographic variables (age, sex, school, grade); one yes/no question assessing whether or not the student saw the play *Butt Ugly*; two further demographic variables for those students who saw the play (age and grade at time of play); and six short answer questions regarding the play (see Appendix B). The cigarette use questions are standard tobacco use questions that have been used by other researchers to measure adolescent smoking behaviour (Abernathy & Bertrand, 1992; Wang et al., 1996). Smoking questions were derived from recommended core questions on tobacco use (Mills, Stephens, & Wilkins, 1994).

Cigarette-related questions:

The cigarette use questions that were ultimately used in calculations for the present study are as follows:

1. Have you ever tried smoking even a puff?
2. On how many of the past 30 days did you smoke one or more cigarettes?

Questions related to the play:

The short answer responses analyzed in the present study are as follows:

1. Do you think the play *Butt Ugly* has influenced **your** decision whether or not to smoke cigarettes?

2. Do you think the play *Butt Ugly* has influenced **other students'** decisions whether or not to smoke cigarettes?

Region B:

The data were obtained through a 41-item survey consisting of three demographic variables (age, sex, school); 18 cigarette related questions; 12 questions related to chewing tobacco, cigars, and snuff; and eight general questions. The questions extracted from the Region B survey are marked with asterisks in Appendix B. For the purposes of the present study, only the demographic variables and those questions related to cigarettes are used in the comparative analyses. The nine cigarette related questions included in the Region A survey were selected from the 18 cigarette related questions included in the Region B survey to enable comparisons between the two groups.

Procedure

Ethical Approval

The study design was approved by the University of Alberta Health Sciences Faculties, Capital Health Authority, and Caritas Health Group Health Research Ethics

Board B: Health Research in May 1998. This acknowledged primary data collection and comparison with pre-collected data in Region B. Permission was granted from Region B for comparison purposes. The parent and student information letters are reproduced in Appendix C and Appendix D, respectively.

Region A:

Signed consent was obtained from each of 10 school principals in Region A, agreeing that their students may participate in the survey and that the results could be used as part of the researcher's thesis (active principal consent). Parental information sheets were sent home with the students describing the proposed study. Parents were asked to phone the researcher if they did not want their child to participate (passive parental consent). One parent declined.

The researcher attended individual classrooms to administer the survey (10 schools, three to seven classrooms per school). At each site, the researcher distributed individual information sheets and surveys to each student and read through each of the key issues on the information sheet. (At two of the three high schools, a trained graduate student assisted by administering the surveys in half of the classrooms to accommodate scheduling requirements of the high school principals.) The students were informed that they could choose not to participate, and could withdraw from the survey at any time without consequences. Students were assured that their responses would be kept confidential. "Please **do not** write your name

anywhere on the survey" was both written on the information sheet and requested verbally of the students. Students were assured that their parents and teachers would not have access to their surveys. There were no incentives provided for participating in the study. The survey took each student about 15 minutes to complete. The Region A surveys were administered in the spring of 1998. No students declined to participate. Some provided incomplete data and their surveys were not used in the analyses. The one student whose parents declined remained in the classroom and was given other tasks by the teacher while the other students filled out the questionnaire in a different room.

Region B:

The surveys were administered in a similar fashion to those in Region A. Trained research assistants attended individual classrooms to administer the surveys. The present researcher was not involved in the data entry or collection for the Region B surveys. The personnel in Region B generously agreed to share their data for comparative purposes with the present study. The Region B surveys were administered in the fall of 1997.

Data Analysis

Based on responses to the cigarette use questions students were classified into three types of smokers: *never-smokers*, *triers*, and *current smokers*[1]. Basic Chi-square tests of association were performed to determine if there is a relationship between exposure to the play and smoking status. Confounding variables such as age and sex were controlled for. Where there were significant differences, a series of logistic regressions were performed with smoking status as the dependent variable (*never-smoker* versus *current smoker*; *trier* versus *current smoker*; and *trier* versus *never-smoker*) to determine the nature of the relationship between exposure to the play and smoking status.

Given that there are only 10 schools in the Region A sample, the students were chosen as the unit of analysis. Students were told that they would not be identified by their name or school. There is justification, however, to analyze the results according to school level (junior high versus high school) since individual schools cannot be identified in this way.

Note that there are no grade 6 or grade 9 students included in the comparison group sample (Table 3). Thus, it was decided to conduct two sets of between region

---

[1] The classification system is consistent with that used in the literature and is described in more detail in the Results Section, Chapter 5.

comparisons: The first set of comparisons includes the grade 6 and 9 students in Region A1 to maintain a larger sample size and to increase statistical power. When Chi-square tests were significant (controlling for school level), a second set of comparisons was completed to examine differences by grade level.

For the first set of comparisons (between regions, junior high), age was included as a predictor for the comparisons between grade 6 and 7 students (Region A1) with grade 7 students (Region A2). Grade could not be used as a predictor given that there was only one level of the grade variable in junior high for Region B (i.e., grade 7).

For the second set of comparisons, (between regions, grade 7 only), the grade 6 students were excluded from the analyses, so that differences could be examined within the same grade. This was done because grade has been found to be a significant predictor of smoking status.

CHAPTER 4: RESULTS SECTION PART 1: SMOKING RATES

Introduction

The present study was designed to determine the effect of the drama *Butt Ugly* on the smoking behaviour of those students that watched it. Two approaches were taken to answer this question. The first approach set to answer the following questions: Is there a relationship between seeing the play and smoking status? If so, what is the nature of this relationship? The second approach set out to answer the following questions: Do the students who saw the play think it was influential in their decisions, and the decisions of other students, whether or not to smoke cigarettes? The smoking status questions will be addressed in this chapter. The questions regarding students perceived influence of the play will be addressed in Chapter 5.

The classification system used to define adolescent smoking status is described in the present chapter. Rates of *never-smokers*, *triers*, and *current smokers* were calculated for each group (Region A1, Region A2, and Region B). To determine if there is an association between seeing the play and smoking status, a basic test of association (Chi-square) was performed for each group. Where there were statistically significant differences, further analyses were done (layered Chi-square analyses) to control for the effects of potential confounding variables, and to

determine the nature of the relationship between seeing the play and smoking status (logistic regression analyses, i.e., does exposure to the play predict smoking status?).

The proportion of adolescent *never-smokers*, *triers*, and *current smokers* is presented. Within Region A comparisons and Between Region comparisons are described, including results from 6 chi-square analyses and 6 logistic regressions. The logistic regression equations are presented in the text; the logistic regression tables are presented in Appendix A (Table A2 to Table A7).

Classification System

The coding scheme utilized by Abernathy and Bertrand (1992) was adopted for the purposes of the present study. This scheme was selected because it most appropriately captured the variables of interest, reflecting the stage model of smoking acquisition in adolescents. Other researchers have classified *triers* as youth who have tried smoking but have smoked less than 100 cigarettes in their lifetime. For the present study, the classification system "have tried, but have not smoked in the past 30 days" was chosen versus "have tried but have smoked less than 100 cigarettes". This is in part because many students responded "I don't know" to whether or not they had smoked greater than 100 cigarettes in their lifetime and thus would have been unclassifiable based on coding schemes which utilized this question. The present classification system captures youth whom have never tried smoking (*never-*

smokers), those who have tried it but do not currently smoke (*triers*), and those who currently smoke (*current smokers*).

Based on this coding scheme, only 16 students from the total sample were unclassifiable because of missing data. Respondents were categorized into three types of smokers: *never-smokers*, *triers* and *current smokers*. *Never-smokers* were defined as those who report that they have never tried smoking, not even a puff. *Triers* were defined as those who have tried it but haven't smoked in the past 30 days. *Current smokers* were defined as those who have smoked at least one or more whole cigarettes in the past 30 days.

The idea of collapsing the categories of *never-smokers* and *triers* into one category was considered. Due to the overwhelming consensus in the literature that *triers* differ significantly from *never-smokers*, even if the *triers* do not currently smoke, it was decided to maintain separate categories for these groups of adolescents.

Classification of adolescent smoking status: Results

Table 5 outlines the percent of *never-smokers*, *triers*, and *current smokers* overall in each Region. Table 6 outlines the percent of *never-smokers*, *triers*, and *current smokers* by grade and school level in each Region.

Table 5

Percent of *Never-smokers*, *Triers*, and *Current Smokers* Overall for Each Region

	Region A1 **N = 820**	***Region A2*** **N = 577**	***Region B*** **N = 3138**
Never-smokers	63.0% (517)	38.0% (219)	41.6% (1306)
Triers	23.8% (195)	33.1% (191)	36.3% (1140)
Current smokers	13.2% (108)	28.9% (167)	22.1% (692)

Table 6

Percent of *Never-smokers*, *Triers*, and *Current Smokers* by Grade and School Level for Each Region

	Region A1	***Region A2***	***Region B***
Grade 6	N=444	N=60	--
Never-smoker	70.0% (311)	70.0% (42)	--
Trier	19.2% (85)	25.0% (15)	--
Current smoker	10.8% (48)	5.0% (3)	--
Grade 7	N=229	N=25	N=1665
Never-smoker	67.7% (155)	52.0% (13)	54.5% (907)
Trier	28.8% (66)	40.0% (10)	35.5% (591)
Current smoker	3.5% (8)	8.0% (2)	10.0% (167)
Jr High Overall	N=673	N=85	N=1665
never-smokers	69.2% (466)	64.7% (55)	54.5% (907)
triers	22.4% (151)	29.4% (25)	35.5% (591)
Current smokers	8.3% (56)	5.9% (5)	10.0% (167)
Grade 9	N=88	N=373	--
Never-smoker	34.1% (30)	34.4% (128)	--
Trier	29.5% (26)	32.5% (121)	--
Current smoker	36.4% (32)	33.1% (123)	--
Grade 10	N=59	N=121	N=1473
Never-smoker	35.6% (21)	30.0% (36)	27.1% (399)
Trier	30.5% (18)	37.5% (45)	37.3% (549)
Current smoker	33.9% (20)	32.5% (39)	35.6% (525)
H.School Overall	N=147	N=494	N=1473
never-smokers	34.7% (51)	33.3% (164)	27.1% (399)
triers	29.9% (44)	33.8% (166)	37.3% (549)
Current smokers	35.4% (52)	32.9% (162)	35.6% (525)

Within Region A Comparisons:

When comparing the smoking status variables within Region A, the overall Chi-Square was significant ($\chi^2 = 93.931$, $p < .0001$). There was a relationship between the two groups, that is, between seeing the play and smoking status. From looking at the cross tabulations (Table 5), it appears that there are more smokers among those who did not see the play. Also, the proportion of *never-smokers* appears to be higher among students who did see the play, compared to those who have not (63% versus 38%). These results suggest that the play was successful in encouraging youth not to smoke, but further investigation is required to account for potential confounding variables. The group of Region A students who did not see the play consists of many more high school students. Since the effect of school level (junior high versus high school) is a potential confound, a layered crosstabs procedure was done, controlling for school level (one for junior high and one for high school). When the effect of school level is controlled for, there are no significant differences between the groups in Region A. (Junior High $\chi^2 = 2.365$, $p = .307$; High School $\chi^2 = .764$, $p = .682$).

The difference in the proportion of *never-smokers*, *triers*, and *current smokers* is not statistically significant in Region A within junior high, nor within high school. As shown in Table 6, the layered cross tabulations show that the proportion of *current*

smokers is roughly equal between those who did and did not see the play for junior high students and for high school students.

Between Region A1 and Region B Comparisons:

The overall test of association was significant, ($\chi^2 = 120.544$, $p < .0001$), indicating that there is a relationship between the two groups: students in Region A who saw the play versus students from Region B with respect to smoking status. The cross tabulations in Table 5 show that the proportion of *current smokers* is higher in Region B and that the proportion of *never-smokers* is higher in Region A1. The sample of students from Region A who saw the play consists of more junior high students, and therefore the effect of school level is a potential confound. A layered crosstabs procedure was performed, controlling for school level (one for junior high and one for high school) to account for the potential confounding variable.

When the effect of school level was controlled for, the Chi-square model was significant for junior high ($\chi^2 = 45.019$, $p < .0001$), but not for high school ($\chi^2 = 4.753$, $p = .093$). There appears to be a relationship between smoking status and exposure to the play for junior high students, but not for high school students.

Further analyses were necessary because the Chi-square test does not indicate directionality, and does not take into consideration potential confounds (e.g., gender, social context of smoking, etc.). Hierarchical logistic regression was chosen to further explore these possibilities. Logistic regression is used to predict the presence

or absence of a given outcome (e.g., nonsmoker = 0, smoker = 1). The present outcomes for adolescent smoking status include three stages (*never-smoker, trier, current smoker*). Since there are three levels of the dependent variable, three logistic regressions were performed, comparing:

1. *Never-smokers* (0) vs. *triers* (1): Are those who saw the play more likely to be *never-smokers* than *triers*?

Smoking Status =
constant + sex + age + mom + dad + brother + sister + did not see play.

2. *Triers* (0) vs. *current smokers* (1): Are those who saw the play more likely to be *triers* than *current smokers*?

Smoking Status =
constant + sex + age + mom + dad + brother + sister + did not see play.

3. *Never-smokers* (0) vs. *current smokers* (1): Are those who saw the play more likely to be *never-smokers* than *current smokers*?

Smoking Status =
constant + sex + age + mom + dad + brother + sister + did not see play.

For all regressions:

"saw play" = 0, "did not see play" = 1; male = 0, female =1; mom, dad, brother, and sister variables "doesn't smoke around me" = 0, "smokes around me" = 1

Hierarchical logistic regression was chosen in which predictors of smoking status were entered in two steps. In step 1, sex, age, parental and sibling smoking status were entered to account for the effects of these variables *first*. In step 2, exposure to the play was added to the prediction equation. This procedure evaluated effects of exposure to the play after controlling for effects of the other variables.

Logistic Regression Results: Junior High

1. *Never-smokers* versus *triers*

The results of the logistic regression (see Table A2) suggest that sex, age, parental and sibling smoking, and exposure to the play are significant predictors of smoking status when smoking status is defined as *never-smoker* (0) or *trier* (1). The following logistic regression model was obtained to predict smoking status:

Smoking Status = –6.3231 -.2329(sex) + .4007(age) +.6741(mom) + .3373(dad) + .8256(brother) + 1.001(sister) + .5682(did not see play).

Thus, when the variable sex changes from 0 (male) to 1 (female), the likelihood of being a *trier* decreases by .2329; with increasing age, the likelihood of being a *trier* increases by .4007. The likelihood of being a *trier* also increases for those whose

parents and siblings smoke. When the variable exposure to the play increases from 0 (saw play) to 1 (did not see play) the likelihood of being a *trier* increases by .5682. The relationship between seeing the play and smoking status suggests that junior high students who did not see the play are more likely to have tried smoking than those who did see the play. This finding is consistent with Table 6, which indicates that of those who saw the play (Region A2), 69% of junior high students are *never-smokers* and 22% are *triers*, whereas of those who did not see the play (Region B), 54% are *never-smokers* and 35% are *triers*.

2. *Triers* versus *current smokers*

The logistic regression model (see Table A3) to predict whether youth were *triers* versus *current smokers* indicates that the variables "brother" and "sister" smoking are significant predictors of smoking status, when smoking is defined as *trier* = 0 and *current smoker* = 1. The equation is as follows:

Smoking Status = -3.3558 + .4628(brother) + .7969(sister)

This suggests that the likelihood of being a *current smoker* versus a *trier* increases for youth whose siblings smoke. The other variables were not significant predictors of smoking status in this regression, including exposure to the play.

3. *Never-smokers* versus *current smokers*

The variables which were significant predictors of smoking status when smoking status is defined as *never-smoker* (0) and *current smoker* (1) are age and parental and sibling smoking status (Table A4). The regression equation is:

Smoking Status = -8.7922 + .5036(age) + .5984(mom) + .3731(dad) + 1.2425(brother) + 1.7086(sister)

That is, with increasing age, the likelihood of being a *current smoker* versus a *never-smoker* increases. Of course this makes intuitive sense. The older you are, the more time you have had to become a *current smoker*, the more exposure to social influences of smoking, etc. Also, when parents and siblings smoke, the likelihood of being a *current smoker* versus a *never-smoker* increases. The variable "exposure to the play" was not a significant predictor of smoking status for this regression.

Logistic Regression Results: Grade 7

To further investigate the nature of the relationship between exposure to the play and smoking status, I conducted the same three logistic regressions looking only at grade 7 students. This decision was made because the Region B sample for junior high consists of only grade 7 students, whereas the corresponding Region A sample consists of both grade 6 and grade 7 students. Thus, the grade 6 students from Region A were excluded from the following three analyses.

1. *Never-smoker* versus *triers*

The variables age, parental and sibling smoking status, and exposure to the play were significant predictors of smoking status when smoking status is defined as *never-smoker* (0) and *trier* (1) (Table A5). The regression model is:

Smoking Status = -5.6144 + -.2335(sex) + .3578(age) + .6530(mom) + .4173(dad) + .9232(brother) + .8102(sister) +.3806(did not see play).

When sex = 1 (female), the likelihood of having tried smoking in grade 7 decreases. When age increases, the likelihood of having tried smoking increases by .3578. When parents and siblings smoke, the likelihood of having tried smoking increases. When exposure to the play equals one, that is, for those who have not seen the play, the likelihood of having tried smoking increases by .3806.

2. *Triers* versus *current smokers*

Age, sister's smoking status, and exposure to the play are significant predictors of smoking status when smoking status is defined as *triers* versus *current smokers* (Table A6). The regression model is

Smoking Status = -7.6259 + .4018(age) + .8857 (sister) + .8460 (did not see play).

When age increases, the likelihood of being a *current smoker* versus a *trier* increases by .4018. When the respondent's sister smokes, the likelihood of being a *current smoker* increases by .8857. The likelihood of being a *current smoker* increases by .8460 for those who have not seen the play (seen play = 0, have not seen play = 1). Sex was not a significant predictor of smoking status in this model.

3. *Never-smokers* versus *current smokers*

Age, parental and sibling smoking, and exposure to the play are significant predictors of smoking status (Table A7) when smoking is defined as *never-smoker* = 0 and *current smoker* = 1. The Regression model is:

Smoking Status = -14.2590 + .8437(age) + .6121(mom) + .4825(dad) + 1.2320(brother) + 1.6295(sister) + 1.2144(did not see play).

As expected, with increasing age, the likelihood of being a *current smoker* versus a *never-smoker* increases. The likelihood of being a *current smoker* increases for those whose parents and siblings smoke compared to those whose parents and siblings do not smoke. For those who have not seen the play (i.e., exposure = 1) the likelihood of being a *current smoker* versus a *never-smoker* increases by 1.2144. Sex was not a significant predictor in this model.

CHAPTER 5: RESULTS SECTION PART 2: SHORT ANSWER RESPONSES

Introduction

The present chapter outlines the results of the two short answer responses analyzed for this study:

1. Do you think the play *Butt Ugly* has influenced **your** decisions whether or not to smoke cigarettes?
2. Do you think the play *Butt Ugly* has influenced **other students'** decisions whether or not to smoke cigarettes?

Procedures for short answer response coding are included and proportion of inter-rater agreement reported. The junior high responses are presented separately from the high school student responses, because their response patterns differed. The response categories are presented in Appendix A (refer to Tables A8 through A17).

Research Questions

The second approach to determine the effect of the play *Butt Ugly* on smoking behaviour was to ask students whether or not the play was influential with regard to their smoking decisions. To answer this question, students were first asked to respond to the following forced choice questions: "Do you think the play *Butt Ugly* influenced your decisions whether or not to smoke cigarettes: Yes or No?", and "Do you think

the play *Butt Ugly* influenced other students' decisions whether or not to smoke cigarettes: Yes or No?"

Following each of the above questions, students were asked to explain their choice of a yes or no answer. (In some instances, students inserted a third choice, "both yes and no" and offered an explanation for this choice. Thus, a third category "both" is presented where applicable.) The purpose of asking for explanations was to determine the students' reasons for indicating whether or not the play was influential.

The percent of students indicating "yes", "no", and "both" for each question were calculated. Also, the types of "yes", "no", and "both" answers were coded according to response categories.

Short Answer Response Coding

The responses of each student were transcribed verbatim from the surveys into table format in Microsoft Word. Response categories were generated from the data based on the researcher's thorough review of the students' responses. The first round of categorizing consisted of the researcher reading each response and listing a series of response categories. For instance, many responses included "the play showed the effects of smoking" or "the play showed the consequences of smoking". Thus, "showed effects/consequences" was listed as a response category.

Several categories of "yes", "no", and "both yes and no" responses emerged for each question for both the junior high and the high school students. The

researcher assigned a number to each response category. This number is referred to as the "category code".

Next, the verbatim responses were printed out in table format. Each response was re-read, and the researcher assigned a category code to each response. Where the response did not match a category code, the label "other" was given.

The response categories were validated by three raters (two graduate students and one thesis supervisor). The raters were skilled in research methods, and had exposure to qualitative methods. Each rater also had some knowledge of adolescent tobacco use research. Inter-rater agreement ranged from 70.6% to 78.8% among the three raters; mean agreement was 74.1%.

Short Answer Results

The responses of the 822 students from Region A who saw the play *Butt Ugly* are categorized below. The response pattern was markedly different for junior high versus high school students and thus their responses are described separately. Most of the junior high students reported that the play influenced their decisions; whereas most high school students reported that the play did not influence their decisions. However, most high school students reported that the play influenced the decisions of other students. Thus, the high school students did attribute effectiveness to the play for others, albeit not for themselves.

Junior High

1. Do you think the play *Butt Ugly* has influenced **your** decisions whether or not to smoke cigarettes?

Most of the junior high students (68.6%) reported that "yes, the play influenced my decisions whether or not to smoke cigarettes". (Table 7 shows the frequency of "yes", "no" and "both" responses to this question.) The response categories are summarized in Appendix A, Tables A8, A9, A10, A11, A12, and A13. Of those who reported "yes", the most common explanation was that the play showed the effects/consequences of smoking. For example, "Yes because now that I know what cigarettes can do to you I really don't want to smoke". The second most common response category was fear of death/desire to be healthy. Examples included: "I don't want to die" or "I want to be healthy". Of those that reported "no", most explained that this was because they didn't want to smoke anyway (Personal decision not to smoke) or they already knew the effects of smoking (Redundant information).

Table 7

Junior High Response Frequencies: Did the Play Influence You?

Influence you	N	%	Valid %
Yes	463	68.6	69.9
No	185	27.4	27.9
Both	14	2.1	2.1
Subtotal	662	98.1	100.0
No Response	13	1.9	
TOTAL	**675**	**100.0**	

2. Do you think the play *Butt Ugly* has influenced **other students'** decisions whether or not to smoke cigarettes?

Most junior high students (72.3%) reported that the play influenced other students' decisions whether or not to smoke cigarettes. (Table 8 outlines the frequency of "yes", "no", and "both" responses to this question.)

Table 8

Junior High Response Frequencies: Did the Play Influence Others?

Influence Others	n	%	Valid %
Yes	488	72.3	77.5
No	110	16.3	17.5
Both	32	4.7	5.1
Subtotal	630	93.3	100.0
No Response	45	6.7	
TOTAL	**675**	**100.0**	

The response categories are presented in Appendix A, Tables A11, A12, and A13. Of those that reported "yes", the most common reason was that the play showed the effects/consequences of smoking. Many students indicated that "I know people who quit or don't smoke because of *Butt Ugly*" (Personal example of influence). Several others noted that the play was influential because it was entertaining (e.g., "the message gets through better in dramatic form"): These types of examples formed the category "Effective medium/source". Of those that reported "no", the most common reason cited was addiction (e.g., they're addicted; they can't really quit). The second most common reason for "no" responses was apathy (e.g., "they don't care).

High School

1. Do you think the play *Butt Ugly* has influenced **your** decision whether or not to smoke cigarettes?

Most of the high school students who saw the play (64.6%) indicated that "no, the play did not influence my decisions whether or not to smoke cigarettes". (The frequency of "yes", "no", and "both" responses are presented in Table 9.) The response categories are presented in Tables A14 and A15. Whereas only 26.5% of the high school students reported that the play influenced their decisions (Table 9), most of these students attributed it to the fact that the play showed the effects/consequences of smoking (Table A14). Other responses included "It helps with peer pressure", "I don't want to die/get cancer", and "It reinforced my opinions against smoking". Note that most of the students who reported "no" explained that the play did not influence them because they didn't want to smoke anyway (Table A15). The second most common response categories among those who reported "no" was that it was their own decision to smoke.

Table 9

High School Response Frequencies: Did the Play Influence You?

Influence You?	n	%	Valid %
Yes	39	26.5	28.9
No	95	64.6	70.4
Both	1	.7	.7
Subtotal	135	91.8	100.0
No Response	12	8.2	
TOTAL	**147**	**100.0**	

2. Do you think the play *Butt Ugly* has influenced **other students'** decisions whether or not to smoke cigarettes?

High school students were more likely to report that the play influenced other students than they were to report that the play had influenced their own decisions whether or not to smoke cigarettes. Over 60% of the high school students reported that the play influenced other students' decisions (Table 10).

Table 10

High School Response Frequencies: Did the Play Influence Others?

Influence Others?	n	%	Valid %
Yes	89	60.5	70.6
No	35	23.8	27.8
Both	2	1.4	1.6
Subtotal	126	85.7	100.0
No Response	21	14.3	
TOTAL	**147**	**100.0**	

The response categories are presented in Table A16 (yes responses) and Table A17 (no responses). The most common "yes" response category was "Personal example of influence". Common responses in this category included "I know people who've quit or don't smoke because of *Butt Ugly*" (Table A16). The second most common explanation for why the play was influential for other students was that the play showed the effects/consequences of smoking. Other response categories included "They want to be like the actors" and "Because the kid whose dad died scene was sad".

Of those who indicated that the play was not influential for other students, most offered no comment (Table A17). Next to this, the most common response categories were "It's a personal choice" and "They still smoke". Further comments included "No one cares" and "Your friends influence you more".

The results from the short answer responses are discussed in the context of the literature and with reference to the findings from the smoking rates in the discussion section, which follows.

CHAPTER 6: DISCUSSION

Introduction

The present section outlines the results and findings within the context of the literature. The analyses of the smoking rates are discussed first, followed by the findings from the short answer responses. The overall results (both smoking rates and short answer responses) are discussed within the context of Bandura's Social Learning Theory (1977), specifically the four processes of attention, retention, motor reproduction and motivation. Strengths and limitations of the intervention and of the research design are discussed, and conclusions are made.

Research Questions

The present study was designed to determine the effect of the drama *Butt Ugly* on the smoking behaviour of those students that watched it. Two approaches were taken to answer this question. The first approach involved a self-reported measure of smoking status: Is there a relationship between seeing the play and smoking status? If so, what is the nature of this relationship?

The second approach involved short answer responses regarding students' perceived impact of the play: Do the students who saw the play think it was

influential in their decisions, and the decisions of other students, whether or not to smoke cigarettes?

Smoking Rates

Within Region A

When comparing within Region A, there were no significant differences in the proportion of *never-smokers*, *triers*, and *current smokers* among junior high students, nor among high school students for those who saw the play versus those who did not. This suggests that there was no relationship between exposure to the play and smoking status for students within Region A. However, the Within Region comparison sample sizes were quite uneven (Table 1). Most junior high students had seen the play, therefore the Within Region comparison sample was very small for junior high. Most high school students had not seen the play (n = 494), so the Within Region comparison sample was disproportionately large for high school.

Also, it is possible that the students Within Region A who did not see the play were still impacted by the play to an extent. Any post-drama discussion which occurred in the schools afterwards, classroom activities (facilitated by use of the teacher's resource pack), etc., may have had additive effects. The influence of the play may have spilled across the actual day of the presentation and into the conversations and social atmosphere of the students in the Region. Moreover, given the small number of junior high students who did not see the play, it would have been

more difficult to detect statistical differences. Similarly, given the relatively few number of high school students who saw the play, (compared to those who did not see the play), it would have been more difficult to detect statistical differences.

Between Regions

Junior High

When comparing between regions, there was a relationship between exposure to the play and smoking status for junior high students, but not for high school students. The nature of the relationship between exposure to the play and smoking status at the junior high level was explored through a series of logistic regressions.

The predictors age, sex, parental and sibling smoking status were entered first in the logistic regression model. The predictor exposure to the play was entered in step two. There was considerable theoretical support for choosing these predictor variables. Students whose parents and siblings smoke are more likely to smoke than those whose parents and siblings don't smoke. For example, Britt and Jachym (1996) found that whether or not a child's siblings smoke was the second most important predictor for whether or not the child has tried smoking. It seems obvious, that if an adolescent's parents and siblings smoke, there would be greater access to tobacco products in the home. Ease of acquiring the substance is related to likelihood of experimentation. These predictors were included to lend greater support to the investigation of potential effects of the play.

After accounting for these predictor variables, junior high students who did not see the play were more likely to have tried smoking than those who did see the play (Table A2). This suggests that the play is at least preventing some youth from trying smoking. Although the sample sizes were not the same (675 versus 1669), the effect of other variables was controlled for, and the N=675 was considered sufficiently large. (e.g., better measure than the Within Region comparison N's 675 versus 85). All of the predictor variables were significant in predicting those who have tried smoking. Students were more likely to have tried if male, if their mom smokes, dad smokes, brother smokes, and sister smokes. Abernathy and Bertrand (1992) found that a greater proportion of males than females had tried smoking and were *current smokers* in grade 6. Although in their sample, the girls had outnumbered the boys by grade 7. The results of the present logistic regression (*never-smoker* versus *trier*) suggest that boys are still more likely to have tried smoking than girls in both grade 6 and 7. The parental and sibling variables were significant, consistent with previous research (Britt & Jachym, 1996).

The variable exposure to the play did not predict smoking status for the other two logistic regressions, between regions, junior high. Other predictor variables were significant. For example, junior high students were more likely to be *current smokers* than *triers* if their brother smokes and their sister smokes. Again, this finding is

consistent with literature (Britt & Jachym, 1996). Siblings exert considerable social influence over each other.

Junior high students were more likely to be *current smokers* versus *never-smokers* if they were older, their mom smokes, their dad smokes, their brother smokes, and their sister smokes. Parental smoking status was a significant predictor of *current smoker* versus *never-smoker* and not a predictor of *current smoker* versus *trier*. It may be that parents have less influence once a student has tried smoking for whether or not he/she will become a *current smoker*. Junior high students are more likely to remain *never-smokers* if their parents do not smoke.

Grade 7

The 229 grade 7 students who saw the play in Region A were compared to the 1669 grade 7 students in Region B. The results from the logistic regressions suggests that youth who did not see the play were more likely to be *current smokers* versus either *triers* or *never-smokers*, and also more likely to be *triers* than *never-smokers*. This suggests the play was successful in encouraging youth not to smoke for grade 7 students. Accounting for other variables lends even further support to this claim; that is, the effect of the play was significant after accounting for the effect of other predictor variables.

Again (as with the junior high logistic regression), all of the variables were significant in predicting *triers* versus *never-smokers*. Males, those who were older,

whose mom, dad, brother, and sister smoked, and, those who did not see the play were more likely to have tried smoking. For *triers* vs *current smokers*, age, sister and exposure to the play were significant.

To explain why the variable sister would have been significant here and not brother, it could be that since more females smoke with increasing age, that it was more likely for these students to have sisters who smoked as opposed to brothers. Sex of respondent was not a significant predictor for *triers* versus *current smokers*. For the final logistic regression between regions, for grade 7, all of the predictor variables except for sex were significant. For grade 7 students, the play is associated with a decreased likelihood of being either a *current smoker* or a *trier*.

Had the observed differences been more a function of regional differences versus exposure to the play, a similar trend should have occurred for both junior high and high school; however, this was not the case. The results here suggest that the drama, at least in part, accounts for a decreased likelihood of *trying* smoking (junior high) and of both trying and becoming a *current smoker* (grade 7 only). These are substantiated by the junior high students' beliefs that the drama has influenced both themselves and other students, which will be discussed following the discussion of the high school findings, next.

High School

The lack of statistical significance at the high school level may be partially explained by the fact that the high school students did not have any coordinated classroom activities to complement and reinforce what was presented in the drama. For these students, the experience may have been that of simply seeing a play, which is what some students indicated in the short answer responses.

It's possible that the play had some effect at the time (although this was not measured) and that treatment effects have eroded over time. This would be consistent with the literature that treatment effects often disappear by grade 9 (Flay et al., 1989). This illustrates the need for continued programming in high school. The drama is presented to the students in junior high. To the best of my knowledge there is no coordinated plan after *Butt Ugly* for continued tobacco use prevention for adolescents once they enter high school in Region A. Recommendations for continued programming is consistent with recommendations made by authors who have followed students exposed to programs in junior high (Ellickson et al., 1993; Flay et al., 1989). A review of the short answer responses follows.

Short Answer Responses

Junior High

The majority of junior high students indicated that the play influenced their decisions whether or not to smoke cigarettes (Table 7). The most common

explanation was because the play showed the effects/consequences of smoking (response category "effects/consequences", Table A8). This suggests that the message is getting through to the students. They paid attention, remembered the message, and attributed influence to the play. And the regression model (Table A2) suggests that they were less likely to have tried smoking than those who didn't see the play. These results suggest, that at least for those who have not tried smoking before the play, that it is successful at the junior high school level. Bandura's (1977) fourth process "motivational processes" seems to have occurred. That is, the students perceived the outcomes as personally relevant, and most attributed influence of the play at least in part to their decision making processes.

The junior high students showed a similar pattern for the second short answer question, "Do you think the play *Butt Ugly* influenced other students' decisions whether or not to smoke cigarettes?" Most reported that the play did influence others, because it showed the effects/consequences of smoking.

Other response categories indicate that the play evoked strong emotion from the students, such as fear of death, which is a very difficult task given their sense of immediacy versus the future. This is consistent with the finding by Parker et al. (1996) whereby youth recommend that showing long term effects would be an effective smoking prevention strategy.

It is important to note that the junior high students were afforded an opportunity for post-drama discussion, immediately after the presentation. Also, further discussion is likely to have occurred for those students whose teachers utilized the resource manuals. Johnston and Ettema (1982) have indicated that post-viewing discussion leads to more positive outcomes than viewing without discussion. As such, students were enabled to meaningfully participate in the intervention, to enhance the likelihood that they would remember it as something more than just a play.

High School

The response pattern differed for high school students. They were more likely to report that "no" the play did not influence their decisions, and to cite "personal decision not to smoke" as the most important influence on decision making. These youth clearly value self-determination over outside influence, and believe that they are in control of their decision making processes. Indeed, youth at later stages of development tend to acquire a more cynical view of authority (Bell et al., 1993) and to have an increased sense of independence. Note they were specific to mention the decision not to smoke. The next most frequent category was personal decision to smoke. It is possible that the play had an influence at the time and that the students no longer attribute this to the play once they are older. However, the overall smoking

rates do not substantiate this claim. It seems more reasonable to suggest that there are no long-term behavioural changes associated with the drama.

In terms of social learning, attention processes were met as well as retention – the high school students had clearly paid attention to an intervention two years ago, and could remember specific examples from the drama. Although the third process: motor reproduction (behaviour) is not shown statistically, many youth report that they know people who don't smoke because of *Butt Ugly*, which is itself a meaningful finding. The high school students believed that the fourth process, motivation, was met for other students. That is, they perceived that the drama was influential for other students, who would have perceived the outcomes as personally relevant. For example, high school students reported that the play was influential because "they [other students] want to be like the actors", however it was not shown for them as individuals. They were more likely to cite themselves as the largest influence.

It is interesting to note that it is in fact peers, parents, siblings, and other social surroundings that exert the strongest influence on these young people, although at the time they do not want to admit that anyone or anything else has influence over their decisions. Prevention strategies in high school should reinforce personal decision making capacities and autonomy.

The students saw *Butt Ugly* in junior high. Other than a select few who may participate as actors in *Butt Ugly* in high school, there is no follow-up tobacco

programming aimed at the students in high school. Also, some of the junior high students in 1997 may have benefited from follow-up programming through their teachers' use of the resource manuals, whereas the high school students who saw the play in 1995 would not have been, although this was not directly measured in the present study.

Strengths

Sample size

The overall sample sizes were large. Preliminary considerations were based on collecting only from a small sample of those who had seen the play. Instead, it was decided to survey closer to the whole population of grade 6, 7, 9, and 10 students. Also, there was existing comparison group data from Region B, which also consisted of nearly the entire population of grade 7 and 10 students.

Data collection procedures

There were similar data collection methods in both regions. The data were collected by the researcher and/or trained assistant. Students were assured confidentiality of responses, thus maximizing the validity of self- reports. This may have been compromised had the surveys been administered by an authority figure, such as a teacher.

The data were collected 6 months later in Region A compared to Region B. This provided students in Region A with 6 more months to both try smoking and/or to become current smokers.

Theoretical basis for program

There is considerable theoretical support for the foundations of the program. Bandura's social learning model (1997) indicates that models with high social status will be more effective. Older peers are utilized to meet this criterion. For this reason, many other studies have utilized older peers and have found that peers are effective teachers of health-enhancing behavior. Also, the medium live theatre has been used effectively in drug use interventions to promote meaningful discussion of issues. Such discussion, in fact, is what may lead to positive outcomes (Flay, 1987; Johnston & Ettema, 1982).

Predictor variables

It was recognized that parental and sibling smoking status, age, and sex are related to youth smoking (Abernathy & Bertrand, 1992; Britt & Jachym, 1996). This strengthens the argument that the play was effective for junior high students, since there is a detectable difference after accounting for these known variables.

Blended approach

Conducting a blended approach including both quantitative and short answer responses enabled comparisons between the findings. For instance, the junior high

reports of influence were substantiated with statistics. The quantitative smoking rates and short answer responses both indicated no influence of the play for high school students.

The only anomalous finding is that the high school students perceived it had influenced others. In fact the most common response category was that the play had influenced others because they knew of people who didn't smoke because of *Butt Ugly*. The students directly attributed influence to the play, for other students' decisions. These same students may be more likely to report that it was their own decision not to smoke cigarettes. While this may not be supported by an overall statistical trend, I believe that this is a meaningful finding. The students' reports indicate a degree of perceived influence, two years later.

Limitations of Intervention

The drama is not intended to prevent all types adolescent smoking. Given the conflicting pressures on youth to smoke, it is not surprising that most recommendations in the literature include a more comprehensive approach to smoking prevention (e.g., Bruvold, 1993). The drama facilitators recognize this fact. The drama is intended as an educational tool. Recognizing this limit, there is inherent strength in the use of drama for smoking prevention.

Best et al. (1988) note that "...contextual programs – which address social systems, developmental issues, and broader values – are more likely to produce

enduring change" (p. 196). The drama is designed to be a starting point—leads to discussion. This was shown in the Captain Clean articles (Harding et al., 1996; Safer & Harding, 1993) whereby drama was an effective tool for soliciting feedback and feelings from high risk Chicago youth. From here it is the school's responsibility to ensure that a comprehensive health education program is implemented.

From my perspective, *Butt Ugly* met its objectives, given that it takes much more to produce long term behavior change. The fact that the students, (a) remembered the play, and (b) attributed decision-making influence to the play for themselves (junior high) and for others (both junior high and high school students) is a meaningful finding.

Limitations of the study design.

Within Region A comparisons

There were small within Region A comparison group sample sizes. There were very few junior high students who had not seen the play, and there were comparatively fewer high school students who had seen the play. This presents difficulties for detecting statistical differences between the groups. Moreover, the within group comparisons were not matched on any criteria, they were simply those students present the day of the survey who had been absent the day of the play.

Peer smoking status

The present study lacks an accurate measure of number of youth's peers who smoke. The initial survey included the question: "How many in your grade do you think smoke cigarettes?" which is an estimate of smoking prevalence versus "How many close friends do you have, and how many of your close friends smoke cigarettes? This was an oversight in the selection of survey questions. The smoking estimate question was not used in the analyses because it has been found that youth tend to overestimate the prevalence of smoking in the population (Sussman et al., 1988).

Teachers' resource manual

The resource manual can be considered both a strength of the intervention and a limitation of the study design. It represents a strength of the program because it encompasses a more comprehensive approach to smoking prevention. It represents a limitation of the study design because it is unknown to what extent the manuals were implemented. Implementation of the drama was not an issue in *Butt Ugly*. The drama toured around to all the schools as planned. However, implementation of the teachers' packs was not measured, thus there could be differential effects within schools accounting for rates of smoking. It is likely that a greater program impact exists for those students whose teachers fully implemented the post-drama sessions.

At the time the high school students saw the play, the teachers' packs had not yet been developed. This may partially explain why there were no observed differences in smoking rates at the high school level. Many authors have recommended that more than one session is required for sustainable change (e.g., Perry & Kelder, 1992).

Post-test comparison group

There were no formal baseline measures of who did or did not see the play. Moreover, it would have been useful to include pre-test measures of smoking behaviour and attitudes. Without such measures, we don't know precisely how many students smoked before or after the play. The design relies on inferences made from the post-test comparison group sample.

Implications

There are several implications of the present study. Primarily, the findings serve as a source of evidence for the effectiveness of the intervention, *Butt Ugly*. This information may be of interest to organizations such as Health Canada, Alberta Health, the regional health authorities, the Alberta Tobacco Reduction Alliance, Action for Smoking and Health, and other health related agencies as an indication of the impact of the drama. The information is also relevant to educators and school administrators, who may wish to develop similar peer-led interventions in their communities.

Another implication is the opportunity to model the *partnerships* developed throughout the *Butt Ugly* project (e.g., school administrators, community theatre group, public health nurse, high school students). This approach enables members to build from each other member's strengths. For example, the professionalism of the drama was enhanced by involving a theatre director and community theatre group in the project, combined with the public health nurse's access to valid health information. High school students served as credible role models for their younger peers. Organizations interested in modeling the *Butt Ugly* program should incorporate similar partnerships to maximize the likelihood of success.

Finally, the findings are also of interest to program facilitators and student actors, as an indication of success and validation of their efforts in tobacco use prevention.

Future Directions

There are several avenues for future research pertaining to the present intervention. For example, the extent to which teachers and school administrators support tobacco use prevention could be measured through individual interviews and the development of survey tools. It is likely that students whose teachers and school administrators support tobacco use prevention as an important public health goal are more likely to be exposed to a culture of anti- tobacco use and thus more amenable to positive program effects. In relation to teachers' attitudes, the implementation level

of the teachers' resource manuals could be measured and compared with students' smoking rates.

Focus groups and individual interviews could be conducted with the high school student actors. These students participate in a meaningful and interactive way to help encourage younger students not to start smoking. This experience is likely to have an empowering effect for the high school students, as they are serving as role models, leaders, and providers of health information.

The present results also indicate that many variables predict youth smoking status, including parental and sibling smoking status. Parents should be included in future studies, and alerted to the impact their smoking has on youth's decisions about tobacco use.

Finally, there are practical considerations for future interventions that model the *Butt Ugly* peer-led interactive drama approach. The program does not exist in a vacuum; it relies on the enthusiasm, skills, knowledge, and co-operation of a diverse set of partners. These variables were not directly measured in the present study, but certainly contributed in part to the program's success. Funding is also an issue - for program staff, costumes, set design, travel and other related costs.

Conclusions

The smoking rates suggest that exposure to the play was related to smoking status for junior high students, such that junior high students who had seen the play

were more likely to be *never-smokers* than *triers*. The short answer responses indicate that the play was perceived to be influential by most junior high students, although not by high school students.

It is important to remember that the drama was not intended to eliminate all youth smoking. The drama was designed as an educational tool, to be used within the context of a broader tobacco use prevention framework. Drama is clearly effective in capturing students' attention and communicating information. Students remember the message, and junior high students appear to act on it. Concerning behaviour, one must remember that the drama is but one of many competing sources for the adolescents' decision making processes about tobacco use. Contact with influential models on a daily basis such as parents, siblings, and peers, with whom they have much more contact than a single intervention – is likely to have a stronger impact on students' decision making processes. This illustrates why it is continually important to implement comprehensive approaches to prevention. It is not surprising that high school smoking increases because the youth are in an environment with more older peers (e.g., grades nine to twelve), of which more are likely to be smokers (given the association between smoking and age), and the opportunities for smoking will increase.

The students both paid attention to the drama, and retained the message 6 months and two years later. In this respect, *Butt Ugly* was successful in

communicating its prevention message (at least for cigarette smoking) to both junior and high school students.

BIBLIOGRAPHY

Abernathy, T.J., & Bertrand, L.D. (1992). Preventing cigarette smoking among children: Results of a four-year evaluation of the PAL program. *Canadian Journal of Public Health, 83* (3), 226-229.

Alberta Tobacco Reduction Plan Steering Committee (1997). *Three year business plan 1997-1998 to 1999-2000.*

Bandura, A. (1977). *Social Learning Theory.* Prentice-Hall Inc., Englewood Cliffs, N.J.

Best, J.A., Thomson, S.J., Santi, S.M., Smith, E.A., Brown, K.S. (1988). Preventing cigarette smoking among school children. *Annual Review of Public Health, 9,* 161-201.

Bell, R.M., Ellickson, P.L., & Harrison, E.R. (1993). Do drug prevention effects persist into high school? How "Project ALERT" did with ninth graders. *Preventive Medicine, 22,* 463-483.

Biglan, A., Severson, H., Ary, D., Faller, C., & Gallison, C. (1987) Do smoking prevention programs really work? Attrition and the internal and external validity of an evaluation of a refusal skills program, *Journal of Behavioral Medicine, 10,* 159-171.

Britt, M.A., & Jachym, N.K. (1996). Cigarette and alcohol use among 4th and 5th graders: Results of a new survey. *Journal of Alcohol and Drug Education, 41* (3), 44-54.

Breslau, N., & Peterson, E.L. (1996). Smoking cessation in young adults: Age at initiation of cigarette smoking and other suspected influences. *American Journal of Public Health, 86*, 214-220.

Bruvold, W.H. (1993). A meta-analysis of adolescent smoking prevention programs. *American Journal of Public Health, 83,* 872-880.

Chassin, L., Presson, C.C., Sherman, S.J., Corty, E., & Olshavsky, R.W. (1984). Predicting the onset of cigarette smoking in adolescents: A longitudinal study. *Journal of Applied Social Psychology, 14* (3), 224-243.

Cohen, R.Y., Felix, M.R., Brownell, K. (1989). The role of parents and older peers in school-based cardiovascular prevention programs: Implications for program development. *Health Education Quarterly, 16* (2), 245-253.

Cunningham, R. (1996). *Smoke & Mirrors: The Canadian Tobacco War.* International Development Research Centre, Ottawa, ON.

Ellickson, P.L., Bell, R.M., & Harrison, E.R. (1993). Changing adolescent propensities to use drugs: Results from Project ALERT. *Health Education Quarterly, 20* (2), 227-242.

Ellickson, P.L., Bell, R.M., & McGuigan, K. (1993). Preventing adolescent drug use: Long-term results of a junior high program. *American Journal of Public Health, 83,* 856-861.

Escobedo, L., Marcus, S.E., Holtzman, D., & Giovino, G.A. (1993). Sports participation, age at smoking initiation, and the risk of smoking among US high school students. *JAMA, 269* (11), 1391-1395.

Flay, B. R. (1986). Mass media linkages with school-based programs for drug abuse prevention. *Journal of School Health, 56* (9), 402-406.

Flay, B.R., Hansen, W.B., Johnson, C.A., Collins, L.M., Dent, C.W., Dwyer, K.M., Grossman, L., Hockstein, G., Rauch, J., Sobel, J.L., Sobol, D.F., Sussman, S., & Ulene, A. (1987). Implementation effectiveness trial of a social influences smoking prevention program using schools and television. *Health Education Research, 2* (4), 385-400.

Flay, B.R., Koepke, D., Thomson, S.J., Santi, S., Best, J.A., & Brown, K.S. (1989). 6-year follow-up of the first Waterloo school smoking prevention trial. *American Journal of Public Health, 79,* 1371-1376.

Gliksman, L., Douglas, R.R., & Smythe, C. (1983). The impact of a high school alcohol education program utilizing a live theatrical performance: A comparative study. *Journal of Drug Education, 13* (3), 229-248.

Glynn, T.J. (1989). Essential elements of school-based smoking prevention programs. *Journal of School Health, 59* (5), 181-188.

Gordon, N.P. (1986). Never-smokers, triers, and current smokers: Three distinct target groups for school-based antismoking programs. *Health Education Quarterly, 13* (2), 163-180.

Hansen, W.B., Malotte, C.K., & Fielding, J.E. (1985). The bogus pipeline revisited: The use of threat of detection as a means of increasing self-reports of tobacco use. *Journal of Applied Psychology, 70* (4), 789-792.

Harding, C.G., Safer, L.A., Kavanagh, J., Bania, R., Carty, H., Lisnov, L., & Wysockey, K. (1996). Using live theatre combined with role playing and discussion to examine what at-risk adolescents think about substance abuse, its consequences, and prevention. *Adolescence, 31* (124), 783-796).

Johnston, J., & Ettema, J.S. (1982). *Positive Images: Breaking Stereotypes with Children's Television.* SAGE Publications, Beverly Hills.

Klepp, K.I., Halper, A., & Perry, C. (1986). The efficacy of peer leaders in drug abuse prevention. *Journal of School Health, 56* (9), 407-412.

Kozlowski, L., Heatherton, T.F. (1990). Self-report issues in cigarette smoking: State of the art and future directions. *Behavioral Assessment, 12,* 53-75.

Manske, S., Brown, K., Cameron, A.J. (1997). School-based smoking control: A research agenda. *Cancer Prevention & Control, 1*(3), 196-212.

Mills, C., Stephens, T., & Wilkins, K. (1994). Summary report of the workshop on data for monitoring tobacco use. *Health Reports, 6* (3), 377-387.

Murray, D.M., Luepker, R.V., Johnson, C.A., & Mittelmark, M.B. (1984). The prevention of cigarette smoking in children: A comparison of four strategies. *Journal of Applied Social Psychology, 14* (3), 274-288.

Murray, D.M., Richards, P.S., Luepker, R.V., & Johnson, C.A. (1987). The prevention of cigarette smoking in children: Two- and three-year follow-up comparisons of four prevention strategies. *Journal of Behavioral Medicine, 10* (6), 595-628.

Murray, D.M., Davis-Hearn, M., Goldman, A.I., Pirie, P., & Luepker, R.V. (1988). Four-and five-year follow-up results from four seventh-grade smoking prevention strategies. *Journal of Behavioral Medicine, 11* (4), 395-405.

Murray, D.M., Perry, C.L., Griffin, G., Harty, K.C., Jacobs, D.R., Schmid, L., Daly, K., &I Pallonen, U. (1992). Results from a statewide approach to adolescent tobacco use prevention. *Preventive Medicine, 21,* 449-472.

Parker, V.C., Sussman, S., Crippens, D.L., Scholl, D., & Elder, P. (1996). Qualitative development of smoking prevention programming for minority youth. *Addictive Behaviors, 21* (4), 521-525.

Patrick, D.L., Cheadle, A., Thompson, D.C., Diehr, P., Koepsell, T., & Kinne, S. (1994). The validity of self-reported smoking: A review and meta-analysis. *American Journal of Public Health, 84* (7), 1086-1093.

Pierce, J.P., & Gilpin, E. (1996). How long will today's new adolescent smoker be addicted to cigarettes? *American Journal of Public Health, 86* (2), 253-256.

Perry, C., & Kelder, S.H. (1992). Models for effective prevention. *Journal of Adolescent Health, 13,* 355-363.

Rooney, B.L., & Murray, D. M. (1996). A meta-analysis of smoking prevention programs after adjustment for errors in the unit of analysis. *Health Education Quarterly, 23* (1), 48-64.

Rundall, T.G. &Bruvold, W.H. (1988). A meta-analysis of school-based smoking and alcohol use prevention programs. *Health Education Quarterly, 15* (3), 317-334.

Safer, L.A., & Harding, C.G. (1993). "Under Pressure Program": Using live theatre to investigate adolescents' attitudes and behavior related to drug and alcohol abuse education and prevention. *Adolescence, 28* (109), 135-148.

Sussman, S., Dent, C., Mestel-Rauch, J., Johnson, C.A., Hansen, W.B., Flay, B. (1988). Adolescent nonsmokers, triers, and regular smokers' estimates of cigarette

smoking prevalence: When do over-estimations occur and by whom? *Journal of Applied Social Psychology, 18* (7), 537-551.

Telch, M., Miller, L., Killen, J., Cooke, S., & Maccoby, N. (1990). Social influences approach to smoking prevention: The effects of videotape delivery with and without same-age peer leader participation, *Addictive Behavior, 15,* 21-28.

Tobacco Free Capital Region Network (1997). *Capital Health Region Tobacco Reduction Framework*.

Wang, M., Fitzhugh, E.C., Eddy, J.M., & Westerfield, R.C. (1996). Attitudes and beliefs of adolescent experimental smokers: A smoking prevention perspective. *Journal of Alcohol and Drug Education, 41* (3), 1-12.

Worden, J.K., Flynn, B.S., Solomon, L.J., Secker-Walker, R.H., Badger, G.J., & Carpenter, J.H. (1996). Using mass media to prevent cigarette smokoing among adolescent girls. *Health Education Quarterly, 24* (4), 453-468.

APPENDIX A

APPENDIX A: TABLES

Table A1.1

Proportion of Adolescents by Smoking Status (Gordon, 1986)

N = 2, 339	**Gr 7 & 8**
Never-smokers	69%
Triers	8%
Smokers	23%

Table A1.2

Proportion of Adolescents by Smoking Status and Grade (Sussman, 1988)

N = 5, 610	**Gr 8.**	**Gr 9 follow-up**
Never-smokers	33%	29%
Triers	58%	59%
Smokers	9%	12%

Table A1.3

Proportion of Adolescents by Smoking Status, Grade, and Sex (Abernathy & Bertrand, 1992)

N = 3566				
Males	**Gr 6**	**Gr 7**	**Gr 8**	**Gr 9**
Never	67%	58%	50%	45%
Triers	26%	33%	34%	31%
Smokers	5%	8%	15%	20%
Females	**Gr 6**	**Gr 7**	**Gr 8**	**Gr 9**
Never	71%	61%	48%	41%
Triers	23%	28%	31%	30%
Smokers	4%	10%	20%	27%

Table A1.4

Proportion of Adolescents by Smoking Status (Wang et. al., 1996)

N = 9.774	**Age 12 to 18**
Never-smokers	55%
Experimenter	30%
Regular smokers	15%

Table A2

Junior High Between Region A1 and B Results Predicting *Never-smokers* versus *Triers* (Logistic Regression)

Variables Entered	Model χ^2	ß	Wald Statistic
Step 1	222.873**		
Sex		-.2332	5.7794*
Age		.5221	49.9851**
Mom		.6656	34.6402**
Dad		.3437	9.2435*
Brother		.7951	19.7550**
Sister		.9791	29.2834**
Step 2	246.278**		
Sex		-.2329	5.6993*
Age		.4007	25.5708**
Mom		.6741	35.0331**
Dad		.3373	8.7842*
Brother		.8256	20.9927**
Sister		1.0010	30.0562**
Exposure to the play		.5682	22.5748**
Constant		-6.3231	43.2337**

**p < .00001. *p < .05.

Table A3

Junior High Between Region A1 and B Results Predicting *Triers* versus *Current Smokers* (Logistic Regression)

Variables Entered	Model χ^2	ß	Wald Statistic
Step 1	35.967**		
Sex		.0751	.1572
Age		.0905	.1087
Mom		.0642	.1728
Dad		.0587	.1748
Brother		.4729	.1987*
Sister		.8138	.1926**
Step 2	38.846**		
Sex		.0841	.1575
Age		.1650	.1164
Mom		.0515	.1730
Dad		.0848	.1756
Brother		.4628	.1991*
Sister		.7969	.1931**
Exposure to the play		-.3423	.1998
Constant		-3.3558	1.4102*

**p < .00001. *p < .05

Table A4

Junior High Between Region A1 and B Results Predicting *Never-smokers* versus *Current Smokers* (Logistic Regression)

Variables Entered	Model χ^2	ß	Wald Statistic
Step 1	212.893**		
Sex		-.1454	.1608
Age		.5428	.1154**
Mom		.5976	.1836*
Dad		.3736	.1849*
Brother		1.2260	.2309**
Sister		1.7152	.2190**
Step 2	213.737**		
Sex		-.1481	.1609
Age		.5036	.1238**
Mom		.5984	.1837*
Dad		.3731	.1850*
Brother		1.2425	.2319**
Sister		1.7086	.2194**
Exposure to the play		.1748	.1917
Constant		-8.7922	1.5083**

**p < .00001. *p < .05

Table A5
Grade 7 Between Region A1 and B Results Predicting *Never-smokers* versus *Triers* (Logistic Regression)

Variables Entered	Model χ^2	ß	Wald Statistic
Step 1	163.366***		
Sex		-2481	.1053*
Age		.3386	.0919**
Mom		.6545	.1232*
Dad		.4431	.1237**
Brother		.9206	.2031*
Sister		.8004	.2008**
Step 2	168.872***		
Sex		-.2335	4.8866*
Age		.3578	14.9356**
Mom		.6530	27.9749*
Dad		.4173	11.2605**
Brother		.9232	20.5991*
Sister		.8102	16.2437**
Exposure to the play		.3806	5.3350*
Constant		-5.6144	22.5101***

***p < .00001. **p < .003. *p < .05

Table A6
Grade 7 Between Region A1 and B Results Predicting *Triers* versus *Current Smokers* (Logistic Regression)

Variables Entered	Model χ^2	ß	Wald Statistic
Step 1	41.880**		
Sex		.2424	.1778
Age		.4071	.1347 *
Mom		.1067	.1940
Dad		.0773	.1962
Brother		.4172	.2244
Sister		.8724	.2159 *
Step 2	47.386**		
Sex		.2575	.1784
Age		.4018	.1347*
Mom		.1229	.1953
Dad		.0116	.1986
Brother		.4193	.2255
Sister		.8857	.2171**
Exposure to the play		.8460	.3934*
Constant		-7.6259	1.7549**

**p < .00001. *p < .05

Table A7

Grade 7 Between Region A1 and B Results Predicting *Never-smokers* versus *Current Smokers* (Logistic Regression)

Variables Entered	Model χ^2	ß	Wald Statistic
Step 1	183.580*		
Sex		.0755	.1847
Age		.7959	.1514*
Mom		.6265	.2086**
Dad		.5330	.2100**
Brother		1.2092	.2715*
Sister		1.6579	.2494*
Step 2	196.510*		
Sex		.1028	.1863
Age		.8437	.1530*
Mom		.6121	.2112**
Dad		.4825	.2126**
Brother		1.2320	.2758*
Sister		1.6295	.2537*
Exposure to the play		1.2144	.3875**
Constant		-14.2590	2.0128*

*p < .00001. **p < .0002

Table A8

Categories of Junior High Students' "YES" Responses to the question: Do you think the play *Butt Ugly* has influenced **your** decision whether or not to smoke cigarettes?

Category: Yes Responses	***Example: Verbatim Response***	**n**	**%**
Effects/Consequences	*Yes because now that I know what cigarettes can do to you I really don't want to smoke*	195	42.1
Health/Fear Death	*It can kill you*	71	15.3
Influential	*It has influenced me not to smoke*	62	13.4
No comment	--	30	6.5
Reinforced Personal Decision	*I had decided never to smoke but this confirmed my decision.*	26	5.6
Effective Medium/Source	*When the story when a girl was smoking at night and her house caught on fire and everyone made it out but her dog. (it was pretty sad.)*	26	5.6
Made Smoking Unappealing	*It grossed me out*	17	3.7
Somewhat	*It helped some people but others it didn't*	13	2.8
Peer pressure	*I have more courage to say no*	12	2.6
Other	--	11	2.4
		Total N = 463	**(100%)**

Table A9

Categories of Junior High Students' "NO" Responses to the question: Do you think the play *Butt Ugly* has influenced **your** decision whether or not to smoke cigarettes?

Category: No Responses	***Example: Verbatim Responses***	**n**	**%**
Personal Choice Not to Smoke	*I never wanted to smoke*	102	55.1
Redundant Information	*I already knew the effects of smoking*	22	11.9
Ineffective Medium/Source	*It was just a play*	22	11.9
Personal Choice to Smoke	*I think it's my own decision to smoke*	12	6.5
No comment	--	8	4.3
Actors Smoked	*One of the girls I remember smoked so she shouldn't of been in the play*	3	1.6
Other		16	8.6
		Total N = 185	**(100%)**

Table A10

Categories of Junior High Students' "BOTH" Responses to the question: Do you think the play *Butt Ugly* has influenced **your** decision whether or not to smoke cigarettes?

Category: Both Responses	***Example: Verbatim Responses***	**n**	**%**
Reinforced Personal Decision	*I wasn't planning on smoking anyway but it sort of has convinced me more not to.*	5	35.7
Somewhat	*In a way it has and in a way it hasn't (Because the play has taught me that smoking is bad but I don't know what I will do in the future)*	3	21.4
Other	--	6	42.9
		Total N = 14	**(100%)**

Table A11

Categories of Junior High Students' "YES" Responses to the question: Do you think the play *Butt Ugly* has influenced **other students'** decisions whether or not to smoke cigarettes?

Category: Yes Responses	***Examples: Verbatim Responses***	**n**	**%**
Effects/Consequences	*Others saw the effects of smoking and decided not to try it*	132	27.0
Influential	*It was influential*	102	21.0
Somewhat	*To a certain extent*	56	11.5
Personal example of influence	*A lot of people I know stopped smoking after they saw Butt Ugly*	54	11.1
No comment	--	45	9.2
Health/Fear Death	*You can get cancer and you can die*	38	7.8
Made smoking unappealing	*It made smoking look gross so they won't do it*	23	4.7
Some need to hear message	*Because a few people might smoke*	9	1.8
Effective medium/source	*I think this because it had real people with real stories and it also had quite a few funny parts*	7	1.4
Other	--	22	4.5
		Total N = 488	**(100%)**

Table A12

Categories of Junior High Students' "NO" Responses to the question: Do you think the play *Butt Ugly* influenced **other students'** decisions whether or not to smoke cigarettes?

Category: No Responses	***Example: Verbatim Responses***	**n**	**%**
Addiction	*Because people say that it's a habit and it's hard to stop.*	42	38.2
Apathy	*They really don't care*	36	32.7
No comment	--	11	10.0
Already know not to smoke	*We've learned since we were young that smoking is bad for your health & our parents wouldn't let us smoke.*	10	9.1
Personal decision	*I think other students did it over their free will*	4	3.6
Other	--	7	6.4
		Total N = 110	***(100%)***

Table A13

Categories of Junior High Students' "BOTH" Responses to the question: Do you think the play *Butt Ugly* has influenced **other students'** decisions whether or not to smoke cigarettes?

Category: Both Responses	***Example: Verbatim Responses***	**n**	**%**
Somewhat	*Yes because some people weren't even thinking about it & so it made sure they weren't. No because some people are into it and nothing is going to change their mind*	13	40.6
Unsure	*I don't know*	8	25.0
No comment	--	2	6.2
Other	--	9	28.2
		Total N = 32	**(100%)**

Table A14

Categories of High School Students' "YES" Responses to the question: Do you think the play *Butt Ugly* has influenced **your** decision whether or not to smoke cigarettes?

Category: Yes Responses	***Example: Verbatim Responses***	**n**	**%**
Effects/consequences	*They helped show the effects of smoking*	12	30.7
No comment	--	6	15.4
Provokes Thought	*It makes them think*	6	15.4
Peer Pressure	*Yes because at that age is when peer pressure really kicks in*	3	7.7
Fear Death/Cancer	*I don' t smoke because you could get lung cancer*	3	7.7
Still Smoke	*Yes but I still smoke*	3	7.7
Reinforced Personal Decision Not to Smoke	*I never wanted to smoke. Butt Ugly reinforced my opinions on smoking*	2	5.1
Other	--	4	10.3
		Total N = 39 (100%)	

Table A15

Categories of High School Students' "NO" Responses to the question: Do you think the play *Butt Ugly* has influenced **your** decision whether or not to smoke cigarettes?

Category: No Responses	***Example: Verbatim Response***	**n**	**%**
Personal Decision Not to Smoke	*I know for myself not to smoke!*	31	32.6
Personal Decision to Smoke	*I made my own decision to smoke*	27	28.4
No comment/can't remember	--	23	24.2
Bored	*I got bored and tuned out*	5	5.3
Redundant information	*In my family everything was taught at a young age so it didn't really say anything new*	5	5.3
The actors smoked	*It didn't have that much of an effect on me because when we asked the people in the play they smoked*	2	2.1
Parental influence more important	*A lot comes from what you learn at home about decisions from parents*	1	1.05
Invulnerability	*I'm one of those "It won't happen to me people"*	1	1.05
		Total N = 95	***(100%)***

Table A16

Categories of High School Students' "YES" Responses to the question: Do you think the play *Butt Ugly* has influenced **other students'** decisions whether or not to smoke cigarettes?

Category: Yes Responses	***Example: Verbatim Response***	**n**	**%**
Personal Examples of Influence	*My friend quit after watching it*	21	23.6
Effects/Consequences	*Yes because they have seen the consequences*	18	20.2
No comment	--	18	20.2
Provokes Thought	*If they thought about the play it may have let some students think twice*	12	13.5
Peer Influence More Important	*Yes I do but I think that peers influence them more*	7	7.9
Effective Medium/Source	*Because other students wanted to be as cool as the actors*	5	5.6
Other	--	8	9.0
		Total N= 89	***(100%)***

Table A17

Categories of High School Students' "NO" Responses to the question: Do you think the play *Butt Ugly* has influenced **other students'** decisions whether or not to smoke cigarettes?

Category: No Responses	***Example: Verbatim Responses***	**n**	**%**
No comment	--	13	37.1
Personal Decision	*Because everyone (almost) tries it at some point in their life and it's a personal decision*	8	22.9
Still Smoke	*All of my friends have seen it and almost all of them smoke*	8	22.9
Don't care	*No one cares*	5	14.3
Peer Influence More Important	*I think that your friends influence you more than a play*	1	2.8
		Total N = 35	**(100%)**

APPENDIX B

APPENDIX B: REGION A SMOKING SURVEY

*Asterisks indicate questions identical to Region B survey.

1. Name of School: _____

2*. How old are you? Years_____

3*. What grade are you in now? Grade _____

4*. Are you male or female? Male _____ Female _____

5*. Have you ever tried smoking a cigarette, even a few puffs? Yes____ No_____

6*. How old were you when you smoked your first whole cigarette?

___ I have never smoked a whole cigarette; **OR** I was _____ years old.

7*. Have you smoked at least 100 cigarettes in your life? Yes_ No_ I don't know_

8*. On how many of the last 30 days did you smoke one or more cigarettes?

None_____ 1-5 days_____ 6-10 days ____

11-20 days _____ 21-29 days ____ 30 days (every day) ____

9*. On those days that you smoked, how many cigarettes did you usually smoke **per day**? I didn't smoke cigarettes in the past 30 days _____

5 or less cigarettes____ 6-10 cigarettes_____

11-15 cigarettes _____ 16-20 cigarettes _____

21-25 cigarettes _____ More than 25 cigarettes____

10*. Have you ever seriously thought about quitting smoking cigarettes?

I don't smoke ____ Yes_____ No_____

11*. Have you tried to quit smoking cigarettes in the last 6 months?

I don't smoke _____ Yes_____ No_____

12*. Not including yourself, who smokes cigarettes around you?

(You can check more than one for this question.) Nobody_____

Mother, stepmother, or female guardian___ Father, stepfather, or male guardian_____

Brother(s)_____ Sister(s)_____ Other relative(s)_____

Other adults (i.e., coach, family friend, leader)_____

13*. How many people in your grade do you think smoke cigarettes?

None_____ Fewer than half_____

About half_____ More than half_____ All_____

14. Have you seen the play *Butt Ugly*? Yes_____ No_____

The following questions are for students who have seen the play *Butt Ugly*:

15. a) What grade were you in when you watched the play *Butt Ugly*?

Grade_____

b) How old were you when you watched the play *Butt Ugly*?

Age _____

16. Do you think the play *Butt Ugly* has influenced **your** decision whether or not to smoke cigarettes?

Yes____ No____ Please explain your answer in the space provided:

17. Do you think the play *Butt Ugly* has influenced **other students'** decisions whether or not to smoke cigarettes?

Yes____ No___ Please explain your answer in the space provided:

_____

18. What did you **like** about the play *Butt Ugly*?

_____

19. What did you **dislike** about the play *Butt Ugly*?

_____

20. Would you recommend that students from other junior high schools watched the play *Butt Ugly*?

Yes____ No____ Please explain your answer in the space provided:

21. Please include any additional comments about the play *Butt Ugly* or its effect on you:

_____

Thank you very much for filling out this survey. Your input is very important to us.

APPENDIX C: PARENTAL INFORMATION LETTER

Dear Parent:

Hello. My name is Laurie McCaffrey and I am a graduate student from the University of Alberta. I am conducting an evaluation of the anti-tobacco drama *Butt Ugly* for my master's thesis. As you know the drama has been presented to junior high students over the past three years. I would like to know what effect the drama has had on those students whom have seen the production compared to those who have not. Specifically, I want to know whether or not the program has helped to prevent kids from smoking.

I will be visiting your child's classroom in about 2 weeks. I will be asking the students to participate in a survey regarding their smoking behaviour and impressions of the tobacco drama. It will take no more than 30 minutes to complete the survey. Your child's responses will be completely anonymous. Your child will not be asked to write his/her name anywhere on the survey. Individual names will not be included anywhere in any written reports. Only my thesis committee and myself will have access to the questionnaires.

There are no benefits for your child in participating in this study. Participation is completely voluntary. Your child is free to withdraw at any time without penalty. If you have any questions about any aspect of this study, please contact myself, Laurie McCaffrey, at 492-1907. You may also contact any of the members of my thesis committee. Their names and numbers are listed below. You may also contact the Graduate Programs Administrator, Felicity Hey at 492-6407, who is not part of the study. You may call collect. If you do not want your child to participate, please call myself collect.

Sincerely,

Laurie McCaffrey,
Graduate Student, University of Alberta

Dr. Doug Wilson,
University of Alberta,
Phone: (403) 492-7385

Dr. Ollie Triska,
University of Alberta,
(403) 492-1907

Dr. Cam Wild
University of Alberta
(403) 492-9414

APPENDIX D: STUDENT INFORMATION LETTER

Dear Student:

Hello. My name is Laurie McCaffrey and I am a graduate student from the University of Alberta. I would like your help by completing a survey about smoking. I would also like to know your impressions of the drama *Butt Ugly*. Your answers will be used as part of my master's thesis at the University.

It will take about 30 minutes to fill out the survey. **Do not** write your name anywhere on the survey. Your answers will be completely anonymous. No one will be able to trace your answers back to you. Only my thesis committee and myself will have access to your forms. Your parents or teachers will **not** see your answers.

There are no risks or benefits for you to participate in this survey.

By filling out the questionnaire, you are consenting to participate in the study. You are free to change your mind at any time. You are free to choose not to fill out the survey. You may also refuse to answer any question.

If you have any questions about this survey you may call myself, Laurie McCaffrey, at the University of Alberta. Phone (403) 492-1907. You may also call Felicity Hey, Graduate Programs Administrator, who is not part of the study. Phone (403) 492-6407. You may call collect.

Thank you very much for your help.

Sincerely,

Laurie McCaffrey, B.A.
Graduate Student, University of Alberta